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Nurse Perspectives on the Work Impacts of Decentralized Nursing Unit Design

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NURSE PERSPECTIVES ON THE WORK IMPACTS OF DECENTRALIZED NURSING UNIT DESIGN

By

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Bachelor of Science in Human Ecology
Bachelor of Science in Nursing
Master of Science in Nursing

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ABSTRACT

This study investigated nurse perspectives on the work impacts of a decentralized inpatient unit model. The study involved two rural acute-care hospitals in rural Nebraska that moved from a centralized to a decentralized inpatient unit design. The researcher conducted focus group discussions with staff and nursing management at both facilities with a total of 28 participants. In addition, the participants completed a 12-item questionnaire using a five-point Likert scale for responding. Focus group discussion and questionnaire were designed to investigate the areas of quality of care, communication, documentation, stress and wellbeing, and transition. Data gathered revealed that on all survey questions but one, a centralized unit design was preferred, with the exception of supporting nurses' chart documentation. The survey data collected aligned with the focus group findings.

DEDICATION

This thesis is dedicated to my husband Dr. Craig McBride, for your love and support. We have weathered much change since I embarked on this journey, and I truly could not have done this without you.

To my dad in heaven, and my mom, I know how proud you are of me, and I will carry it with me forever.

ACKNOWLEDGEMENTS

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CHAPTER 1

Introduction

In the workforce today, there are over four million nursing professionals who represent the cornerstone of hospital healthcare and delivery. It is projected that the number of registered nurses will grow 15% from 2016 to 2026 (United States Department of Labor, 2017). Unfortunately, this substantial growth in supply will not be enough to meet the demand for nursing professionals, mainly due to retirement, which is estimated to reach 4.14 million by 2020 (Carnevale, Smith, & Gulish, 2015). With a continued shortfall of nursing professionals, it is imperative that healthcare institutions maximize efficiency, effectiveness, and nurse retention while safeguarding quality patient care. With nurses comprising the largest population segment among all healthcare workers, they represent a necessary yet costly resource. This cost drives the need for research-derived evidence to help determine the type of inpatient unit design that is supportive to improved patient and nurse outcomes. Healthcare systems need to attract qualified employees to deliver optimal care, generate cost savings by improving medical outcomes for patients and staff, and increase patient satisfaction through a high quality of care (Ulrich & Zhu, 2007).

More rigorous research is needed to document correlations between the physical environment, the safety and quality of patient care, and patients' experience and outcomes. Prior research has documented associations between the environments in which people work and their job satisfaction and stress; and how a cultural or environmental change will invariably affect these factors. The physical environment must be developed in conjunction with a healthcare environment that supports organizational culture and promotes understanding across disciplines since workplace culture is a significant contributor to nurse job satisfaction and patient outcomes (Hendrich & Chow, 2008).

With the advent of evidence-based design (EBD) in healthcare, a new focus was placed on the importance of measurement in evaluating effectiveness and efficiency of healthcare design features on a range of human outcomes. There is an emerging body of knowledge that correlates the relationship between the built environment and human experience and outcomes. As provider organizations, along with healthcare architects and designers, look to leverage every available resource toward optimizing outcomes, empirical design research is necessary to document, quantify, and predict relationships between design decisions and desired outcomes.

The nurse station has long been considered the nerve center of an inpatient unit, supporting patient outcomes by providing a central place for nursing activities including communication, charting, and supply storage. Additionally, social opportunities of the nurse station have long been thought to mitigate stress and improve job satisfaction (Zborowsky, Bunker-Hellmich, Morelli, & O'Neill, 2010). Healthcare design research has suggested that nurse stations are meaningful places for nurses because of their familiar associations with professional tasks such as patient care documentation, patient care plan developments, and communication with physicians, and other nurses, as well as allied health disciplines (Pati, Harvey, Redden, Summers, & Pati, 2015). Trzpuc and Martin (2010) identified three general types of nursing units: (a) centralized, (b) decentralized, and (c) hybrid.

The traditional design used by nurses, physicians, and allied healthcare workers in a particular unit has been a centralized station (see Figure 1). In the centralized operational model design, the station has functioned as the place where charting, change of shift report, communication with other care team members, clerical tasks, and even breaks occur. This area also typically housed a unit secretary that performed administrative functions such as answering phones and call lights, entering orders, and greeting visitors.

Figure 1. Example of a centralized nurse station

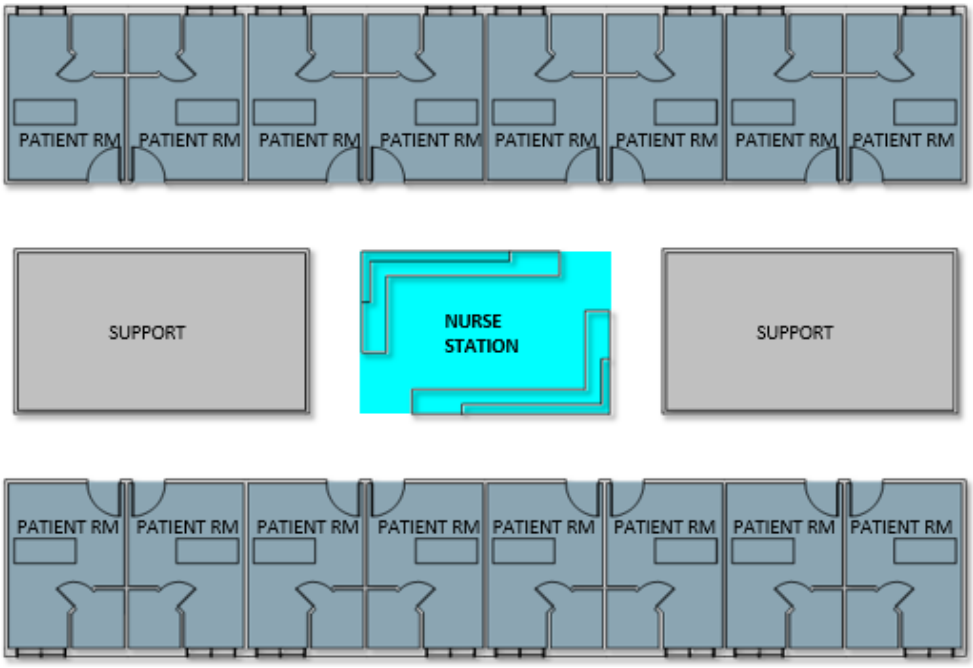
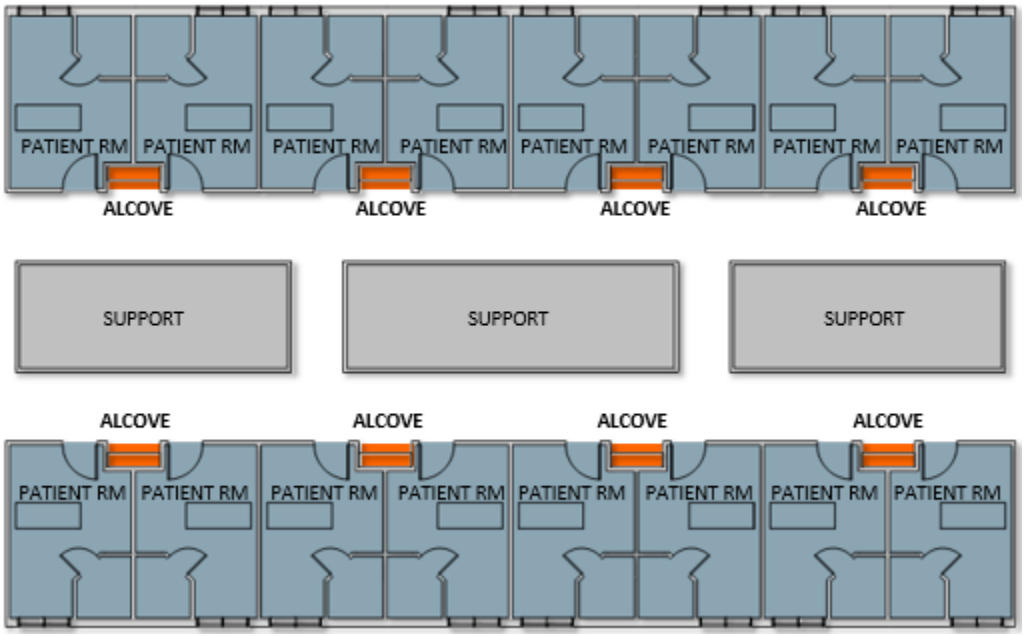


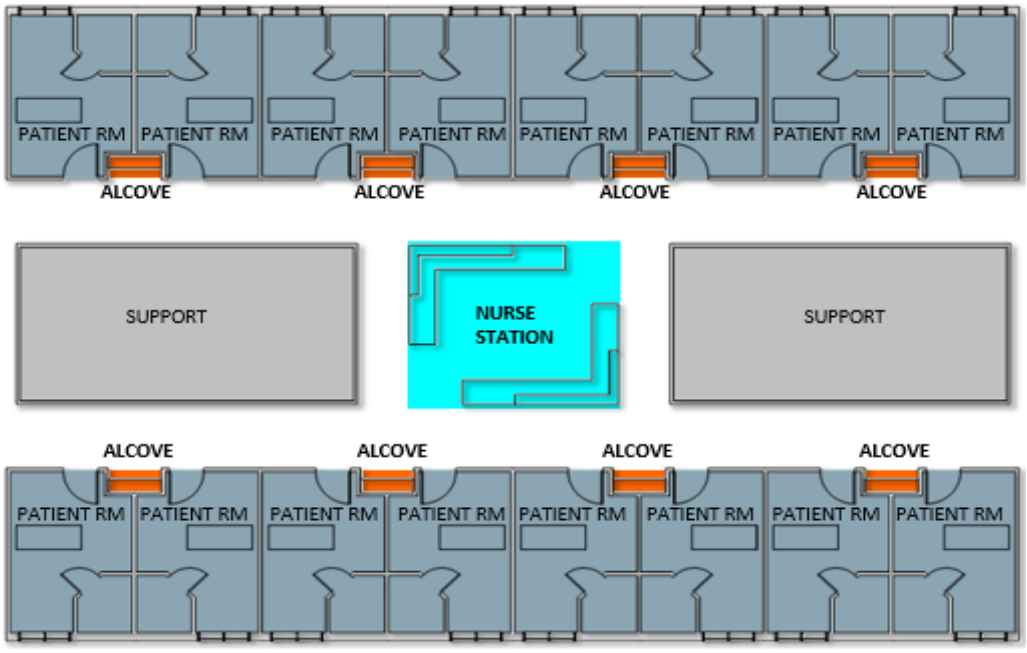
Figure 2. Example of a decentralized nurse station



In a decentralized operational model, the charting area is located immediately outside each or every other patient room, as well as possibly inside the patient room (see Figure 2). Some decentralized units still have a unit secretary who typically sits near the main entrance to the unit. However, if the unit does not have a secretary, the nurses are charged with answering phones and greeting guests in addition to all of their healthcare responsibilities.

A hybrid design model incorporates a central area where care team collaboration can occur along with small areas for charting at the patient room locations, with the majority of workspaces for the healthcare team either outside and/or inside the patient room (Zborowsky et al., 2010) (see Figure 3). If utilized, the unit secretary would work from the smaller central area.

Figure 3. Example of a hybrid nurse station



Information and communication technology improvements have changed nursing and medication documentation, along with provider ordering; it has also changed the way in which healthcare providers communicate with each other and their patients. It is essential to consider how the built environment influences and is influenced by technological advances and how those influences in turn, shape the patient care process and ultimately, patient outcomes (Hua, Becker, Wurmser, Bliss-Holtz, & Hedges, 2012).

Statement of the Problem

Empirical design research is necessary to document, quantify, and predict relationships between design decisions and desired patient and staff outcomes. Although the effectiveness of decentralized nurse stations has been tied to managerial decisions as well as operational and efficiency variables, few studies have addressed all of these factors (Hua et al., 2012). This research plan addresses several relationship questions between hospital design and staff outcomes that remain unresolved in the literature. Focusing the attention on staff outcomes is important, not only to retain high quality staff, but also because other literature has already connected staff satisfaction to patient satisfaction.

Purpose

The purpose of this research is to explore, document, and compare nurse perspectives and experiences working in a decentralized unit model at Great Plains Health Medical Center and Fremont Health Medical Center, two

community hospitals in Nebraska. This research will contribute to the field of evidence-based design (EBD) in regard to how the design of inpatient units can increase nursing staff efficiency and satisfaction, ultimately improve the health and well-being of staff, and thereby also patient populations.

Research Objective

The objective of this study is to assess and document quantitative and qualitative nurse perspectives on the work impacts of the nursing unit design. The study sites were Great Plains Health Medical Center and Fremont Health Medical Center where the investigator explored the following areas of participant experience related to the nursing unit design: (a) nurses' perceived ability to provide quality care for patients, (b) facilitation of professional and social communication, (c) support of nurses' chart documentation, (d) effects on nurses perceived stress and wellbeing in the work environment, and (e) how nursing staff were transitioned from a centralized to decentralized model.

Limitations of the Study

Since data were not collected prior to the transitions to establish a baseline in the previous hospital facility, a pre/post comparison was not possible. Other potential limitations include: (a) recruitment strategy may not represent staff population adequately; (b) rural locations will limit generalizability; and (c) HDR, the employer of this researcher and others coordinating this research, designed both facilities. No one conducting this research was involved with the

facility design and stayed blinded to those who had completed the design. All HDR researchers are trained in and committed to performing unbiased and ethical research.

Definitions of Terms

The following terms are used throughout this thesis, and definitions are provided for clarity.

Centralized nurse station design – Operational model where a single room or area is used by all care team members and other patient-care staff to perform necessary tasks which include the supervision of the unit reception area, patient admissions, and the administration of healthcare services (Zborowsky et al., 2010).

Decentralized nurse station design – Staff work stations located directly outside the room, adjacent to the patient room, or inside the patient room (Zborowsky et al., 2010).

Evidence-based design (EBD) – The process of basing decisions about the built environment on credible research to achieve the best possible outcomes (Center for Health Design, 2017).

Focus group – A group of people brought together in a room to engage in guided discussion of a topic (Teddlie & Tashakkori, 2009).

Hybrid nurse station design – A hybrid design model incorporates a central area where collaboration can occur along with a few small areas for charting

while the majority of workspaces for the healthcare team are positioned inside and/or just outside the patient room (Zborowsky et al., 2010).

Likert scale – A question that measures respondents' level or intensity of agreement or disagreement (ie. strongly disagree to strongly agree) (Teddlie & Tashakkori, 2009).

Organizational culture – The way in which individuals in an organization interact with one another as well as the norms and expectations of behavior (Hendrich & Chow, 2008).

Phenomenological research – Description of the meaning of the lived experiences of several individuals and what the participants have in common. Seeking essentially to describe rather than explain and to start from a perspective free from hypotheses or preconceptions (Teddlie & Tashakkori, 2009).

Saturation – The point in collection of qualitative data when adding more participation units (individual or groups) does not result in new information for theme development (Teddlie & Tashakkori, 2009).

Transcendental phenomenological research – Description of the experiences of the participants in which researchers set aside their own experiences to take a fresh perspective toward the phenomenon they are studying (Teddlie & Tashakkori, 2009).

CHAPTER 2

Review of the Literature

Evidence-based design has sparked a vital sense of inquiry among healthcare design professionals, providers, and leaders surrounding innovations in design to achieve desired patient and staff outcomes. While a great deal of research has emerged over the past decade linking nursing and patient outcomes, less attention has been paid to factors within the nurse work environment, which may have a direct effect on nursing outcomes and, consequently, may influence patient outcomes. The physical environment plays an important role in improving the health and safety of patients and staff, enhancing staff effectiveness and increasing job satisfaction (Ulrich, Zimring, Quan, & Joseph, 2006).

Nurses' efficiency, potential for errors, stress levels, and overall job satisfaction may be affected by a myriad of design issues and their combinations (Chaudhury, Mahmod, & Valente, 2009). In recent years, decentralized nursing models have become the norm for new and renovated hospital facility designs, moving away from a traditional single centralized nurse station. Different nurse station configurations have strengths, weaknesses, and tradeoffs related to the following key issues.

Provision of Quality Care

While there is consistent reference to quality care, little research has explored what elements constitute quality care and what role the environment plays, specifically as to the type of nurse station. A study by Burhans and Alligood (2010), found that nurses described what constituted quality care as being reflective of advocacy, caring, empathy, intention, respect, and responsibility. Job satisfaction has been reported highest when nurses perceived that quality care was delivered; nurses who did not perceive that quality care was being delivered reported high levels of job pressure and role stress (Hall & Doran, 2007). Environmental factors can increase nurses' level of stress which has been associated with lower quality of care (Ternov, 2000).

A growing body of evidence has linked more nursing time per patient-day with better patient outcomes (Hendrich, Chow, Skierczynski, & Lu, 2008). A decentralized nursing unit is currently considered best practice as it may increase functional efficiency by bringing nurses physically and visually closer to their patients (Wade, 2006; Harale, 2010). Several studies have suggested that nurses in decentralized nurse stations spend more time on patient care, building community with patients (Gurascio-Howard & Malloch, 2007; Hendrich, et al., 2008; Hendrich, Fay, & Sorrells, 2004; Ulrich, 2006) and have shorter nurse response times to call lights (Friese et al., 2014; Gurascio-Howard & Malloch, 2007; Zhang, Soroke, Laccetti, Castillero, & Konadu, 2015). From a patient care

perspective in a medical-surgical unit, registered nurses (RNs) in a decentralized environment visited patient rooms more often than those in a centralized unit environment, creating opportunities for additional monitoring of patient safety and condition (Gurascio-Howard & Malloch, 2007). An extensive body of research has confirmed associative relationships among positive work environments, positive nurse outcomes of job satisfaction and retention, and positive patient outcomes (Robert Wood Johnson Foundation, 2014).

Facilitating Professional and Social Communication

A 2006 study by the Joint Commission on Accreditation of Healthcare Organizations found that communication errors were the greatest source of reported sentinel events, indicating that poor communication may be one of the primary factors leading to preventable adverse events such as medication errors and patient falls in clinical practice (Joint Commission, 2007). There is increasing evidence indicating a relationship between the physical environment and communication and, in turn, patient care quality (Ulrich, Berry, Quan, & Parish, 2010). The evidence linking communication deficits and adverse events has led The Joint Commission to rank “improve staff communication” as the second most important focus in the Hospital National Patient Safety Goals for 2017 (Joint Commission, 2017).

Studies have examined, with mixed findings, how communication patterns change between different types of caregivers depending on whether the nurse station is centralized or decentralized. While communication patterns and methods in nursing vary depending on patient population, acuity levels, and type of unit, the nurse station has traditionally been a key location for much of this interaction (Bayramzadeh & Alkazemi, 2014). Nurse communication is not only work-related but includes important relational, mentoring, teaching, and formal and informal learning interactions (Real, Bardach, & Bardach, 2016).

Some research has found that in a centralized model nurses have more opportunities for communicating with colleagues, have a stronger sense of team connection and camaraderie, and sense more support from colleagues as compared to nurses working in a decentralized model (Gurascio-Howard & Malloch, 2007; Parker, Eisen, & Bell, 2012). Zborowski et al. (2010) found significantly fewer social interactions among staff utilizing decentralized nurses' stations, as well as nurses not being able to visualize other caregivers to know when someone needed help. Nurses in decentralized nurse' stations have also reported feeling isolated and found team communication more difficult (Tyson, 2002).

The decentralized model intends to bring the caregiver closer to the patient. In one study, the majority of nurses, nurse technicians, and nurse managers described how the decentralized nurse stations adversely affected

their communication and teamwork process. They believed that the decentralized nurse station reduced care quality, teamwork, proximity to patients, cohesiveness, and nurse-to-nurse community and communication; their colleagues in other disciplines perceived the opposite, that communication improved in a decentralized model (Real, Bardach, & Bardach, 2016). Contrarily, studies have found that overall, decentralized RNs communicated 22% more frequently and spent 42% more time with team members compared to nurses on a similar centralized unit (Gurascio-Howard & Malloch, 2007). In another study, nurses were observed to consult medical staff more frequently in decentralized versus centralized environments (Zborowsky et al., 2010).

Real et al. (2016) suggested that nursing and other disciplines might have to redefine the concept of team. They found that although the nurses were provided training on how to use the new environment, they were not given any training on how to socialize and communicate in the new unit. Together these studies highlighted the importance of considering how the built environment influences communication so that the physical design encourages appropriate social interaction, teamwork, and communication practices such as informal mentoring and learning that can influence patient outcomes positively.

Nurses' Chart Documentation

Healthcare professionals frequently access a computer for entering orders, recording patient care activities, and retrieving clinical information, which

accounts for a major portion of their day. Hendrich & Chow (2008) reported in a time and motion study of nurse documentation that 80.6% of documentation time occurred at the centralized nurse station, 2.8% in the patient room, 15.3% elsewhere on the unit, and 1.3% off the unit. In a study by Howard (2008), nurse charting in a decentralized model consumed 28% of shift time compared to 21% in a centralized model. The decentralized nursing model has been associated with increased frequency of charting and documentation (Pati et al., 2015). Another study demonstrated that time for charting was higher with less time spent at the nurses' station and more time with the patient in a decentralized versus centralized environment (Gurascio-Howard & Malloch, 2007).

Few studies have demonstrated measurable benefits of bedside charting terminals, and no replication of studies in various healthcare settings or more up-to-date equipment have been reported. The Peat Marwick study (1988) found that moving a full function terminal to the bedside resulted in improved delivery of quality patient care, and the nursing units with bedside terminals reported a decrease in errors of omission, greater accuracy and completeness of documentation, a reduction of medication errors, more timely response to patient needs, and improved discharge teaching. In contrast, a study by Marr et al. (1993) found that there was no positive relationship between the presence of bedside terminals and completeness and timeliness of nursing documentation.

There has always been an emphasis on charting at or near the bedside especially when medications are involved (Gurascio-Howard & Malloch, 2007). No studies have examined the accuracy and completeness of nurse documentation in relationship to a centralized or decentralized station.

Effects on Perceived Stress and Wellbeing

Pati et al. (2015) found over recent decades, with the new hospital building standard being private rooms with an emphasis on family-centered rooms, most new inpatient units are nearly 100% larger than previous units with semi-private patient rooms. Furthermore, their recent findings suggest that this size increase translated into nurse walking time that can be as much as 68% more, depending on the level of decentralization. Studies have found that an average nurse on a medical surgical floor walks an average of four miles per 12-hour shift (Hendrich et al., 2008; Pati et al., 2015; Shepley & Davies, 2006). One study found that more than half of nurses seriously considered or were planning to leave nursing for a less stressful, less physically demanding job (Strachota, Normandin, O'Brien, Clary, & Krukow, 2003). MacKusick and Minick (2010) identified three themes as to why nurses left the profession: (a) unfriendly workplace; (b) emotional distress related to patient care; and (c) fatigue and exhaustion. Recent design research has focused on the built environment and ways to lessen the amount of fatigue and stress that nurses experience.

Layout is a key determinant of staff walking distances and proximity to patients (Malkin, 2006), which has been associated with staff fatigue (Reiling, 2006). Several studies have investigated the different types of nurse stations – centralized, decentralized, and a hybrid of the two. Although the findings across studies have been mixed, some of the reported benefits of decentralized nurse stations are improved patient visibility, decreased call light response time, and reduced walking and fatigue. Both empirical and simulation studies have demonstrated less time spent walking in decentralized environments (Hendrich et al., 2004; Pati, Cason, Harvey Jr, Evans, & Erwin, 2012; Rechel, Buchan, & McKee, 2009; Ulrich et al., 2006). Copeland and Chambers (2016) found that decentralized nursing stations were shown to decrease walking distance, maintain RN job satisfaction, and decrease falls in the medical surgical environment.

According to Joseph (2006), operational inefficiencies also contributed to nurses' negative perceptions of their work environments and affected job satisfaction and retention. Other studies, however, have reported higher perceived or actual walking distances with a decentralized layout (Pati, et al., 2015). Nurse station models cannot be the only design consideration in the discussion of walking distance, as medication and supply distribution play a large part in the distances nurse walk in a day. Additionally, the large increase in unit sizes due to larger rooms and more private rooms must be taken into account

when assessing the distances nurses walk. Operational models need to be discussed in accordance with the layout to portray more accurately the amount of walking that a nurse must do to provide patient care (Gurascio-Howard & Malloch, 2007).

Job satisfaction is an important predictor of nurse turnover, patient satisfaction, and nurse-sensitive patient outcomes, which can result in higher healthcare costs and penalties for hospitals that receive Medicare and Medicaid payments (Robert Wood Johnson Foundation, 2014). It is important to evaluate the design of nursing stations so that they cover not only factors such as patient proximity and visual access but also underlying factors such as job satisfaction and informal learning (Harale, 2010). As physical and psychological stress have been identified as possible contributing factors of human error (Ternov, 2000), more research is needed to influence the built environment to leverage operational efficiencies as healthcare environments continue to grow.

Environmental Transition and Organizational Change

Organizational culture refers to the ways in which individuals in an organization interact with one another as well as to the norms and expectations of behavior (Hendrich & Chow, 2008). Different cultures manifest different forms of organizational structuring, physical environment, networking patterns, communication styles, and staff responsibilities. These factors in turn, affect and are influenced by the chosen model of patient care; the model then affects what

kinds of work people do and how they do it (Hendrich & Chow, 2008). There has been little research on how to plan, or on the impact of planning for a new physical work environment or the operational changes that physical environment may require.

When people are forced to work in a new and different manner, many times it leads to an ineffectiveness of the well-established way things have always been done. One study focused on the move from a centralized nurse station environment to a decentralized one and found that hospitals could address the resulting “disorganization” by changing socialization practices, managing nurse expectations, and communication practices (Real et al., 2016). A key finding in this study was that many nursing-related processes did not change in concert with major systematic changes. Medication and supply rooms remained centralized while the nurse stations were decentralized, resulting in a partial system change. To address such issues, hospitals may need formal change programs designed to train and acculturate people to a new process. Such training would need to be recognized and comprehensively developed in advance (Real et al., 2016). The solutions seem to lie in operations design and culture change.

It has been noted that healthcare organizations may get a better return on investment if they place a larger emphasis on the importance of operations and culture when planning the physical environment (Pati, et al., 2015). Thus, social

and behavior elements must be considered when designing and transitioning into a decentralized nursing station environment.

Across all possible impacts of decentralized nurse station design, the current body of evidence is highly mixed and fraught with issues of inconsistent measurement and low generalizability (Jimenez et al., in review). This two-site study addresses several questions that have yet to be resolved in the literature.

CHAPTER 3

Methodology

This study investigated nurse perspectives on changing from a centralized to a decentralized nurse station model in patient units at two rural acute-care hospitals in Nebraska. A review of the literature revealed that there is variation in definition, and limited and conflicting information regarding the benefits and drawbacks of a decentralized patient unit. Conflicting information is found in professional and social communication and the amount of perceived stress and wellbeing of nurses. Information in the areas of care quality, nurse documentation, and transitioning is very limited. This research addressed several questions regarding the relationship between hospital design and staff outcomes that remain unresolved in the literature.

Setting

This study involved two healthcare facilities selected on the fact that both underwent a change in operational model by moving from a centralized nurse station environment to a decentralized nurse station environment in 2015. They were also selected due to proximity of location to the researchers and access to staff. Table 1 describes the demographics and unit characters of the two hospitals.

Table 1

Comparison of Hospital Characteristics

	Hospital A Great Plains North Platte, NE	Hospital B Fremont Fremont, NE
Population of Community Served	24,534 (2013)	26,340 (2013)
Patient Demographics:		
Median Age	37.4	36.9
Median Household Income	$26,474	$49,426
Race/Ethnicity:		
White, Non-Hispanic	86.8%	82.6%
Hispanic	10.1%	14.1%
African American	1.2%	0.5%
Other or Combination	1.9%	2.8%
Education Level:		
High School or Higher	90.3%	86.1%
Bachelor's Degree or Higher	19.2%	19.3%
Total Inpatient (non-behavioral health) Beds	116	61
Payer Mix	Not-for-profit Independent Community Owned	Not-for-profit Independent Community Owned
Model of Care	Decentralized	Decentralized
Date the Hospital Changed to Decentralized	Sept 2015	Feb 2015
Number of Beds per Floor	32	28
Number of New Floors	3	2
Nurse Patient Ratio	5:1	5:1

SOURCE: www.city-data.com

Sampling Strategy

The sample for focus groups consisted of nurses and nurse managers who worked on an inpatient floor either both before and after, or solely after, the change in unit environment. To solicit volunteers, the researcher coordinated with hospital administrators to send an intra-hospital email to all eligible staff nurses and managers (see Appendix A). Volunteers were asked to participate in a study to gain feedback and understand the impacts of their physical work environment. Recruitment included both day and night staff as well as full and part-time staff. Per diem, contract, and travel nurses were excluded. To ensure good representativeness of the convenience sample, efforts were made to include a range of ages, level of nursing experience, exposure to one or both types of unit environments, and shift. A gift card to a local big box store along with a light lunch and beverages were provided to participants.

At each site, the goal was to include all volunteers who were willing to participate, and to conduct at least two focus groups of six to ten staff nurses each and one group of four to eight nurse executives. The staff nurses and managers had separate focus groups so staff nurses were more likely to feel comfortable speaking freely and openly about their experiences. Once the initial questionnaire was completed, only staff members who had either worked in the facility prior to the change in nurse stations or in a previous centralized nurse station environment were able to participate.

Approach

This study qualitatively explored and documented nurse perspectives of the decentralized nursing unit model utilized at each site. A very brief paper-based survey, using Likert scale items, was given to focus group participants at the beginning of each group, both to spur discussion and to facilitate group comparisons. A Likert scale questionnaire, a psychometric bipolar scaling method measuring either a positive or a negative response to an item, was used to determine the opinion or attitude of each of the participants on 12 measures (Teddlie & Tashakkori, 2009).

A phenomenological qualitative approach investigated complex organizational and human experiences through the exploration of executive and nurse staff perspectives and "lived experience" on the units during focus group conversations. Phenomenological research describes the meaning of the lived experiences of several individuals during a shared phenomenon (Creswell, 2012). These participants have the shared phenomenon of working in a centralized nurse unit before transitioning to their current decentralized unit model Transcendental phenomenological research focuses on the description of the experiences of the participants. Researchers set aside their own experiences to take a fresh perspective toward the phenomenon they are studying. It seeks essentially to describe rather than explain, and to start from a perspective free from hypotheses or preconceptions (Husserl & Findlay 1970).

Researchers reduce data to “significant statements” from which they construct themes and descriptions and then reduce them to an overall essence of the experience (Moustakas, 1994). Phenomenological research further examines the particular experiences of unique individuals in a given situation, thus exploring what is conceived to be (Teddlie & Tashakkori, 2009).

This methodology was used to search for patterns and trends by identifying shared beliefs that have yet to be addressed by existing literature (Creswell, 2012). Advantages of using a phenomenological approach are similar to advantages of qualitative research. This method allows findings to emerge rather than to be imposed by a researcher. In addition, it is a critical, rigorous, systematic investigation of human phenomenon (Watters & Biernacki, 1989). In this study, the researcher immersed herself in the data with an openness to many perspectives and then began to describe and understand the viewpoint of those participants experiencing the decentralized environment and the environmental change. Through an interactive process of examination, questioning, and re-examination, the researcher eventually described the “what” and “how” of the participants’ experiences (Creswell, 2012).

Focus groups were semi-structured group interviews with nursing staff and executives who experienced a transition from a centralized nursing unit to a decentralized environment. A focus group is a small group of people led through a discussion by a skilled moderator. The group needs to be large enough to

generate rich discussion but not so large that all participants are hesitant to participate actively. This form of data collection allows the researcher and participants to engage in a dialogue whereby initial questions are modified in light of the participants' responses, and the investigator is able to probe interesting and important areas that arise (Teddlie & Tashakkori, 2009).

Data Collection

The researcher secured appointments to meet the administrators and key personnel in January of 2017. Administrators agreed to the study and allowed access to staff and the facility (see Appendix B). Hospital leadership agreed to assist in the scheduling of focus group sessions around work hours and/or cover missed shifts.

The focus groups were conducted in a meeting room in each facility. The room was comfortable with tables and chairs and located in a convenient location that was conducive to privacy. The researcher provided participants with a light snack and beverage. As an Institutional Review Board (IRB) (see Appendix C) designated the protocol with an Exempt status, at each scheduled group, a Study Information Sheet was provided to participants (see Appendix D). The researchers ensured that participants understood the purpose of the study and their rights as participants. Participants retained a copy of the Study Information Sheet. The focus groups lasted for 90 minutes with the first 15 minutes dedicated to the following process:

1. Participants received the Study Information Sheet, and a qualified Collaborative Institutional Training Initiative (CITI) certified researcher discussed any questions they asked about the study.
2. Participants completed the front side of the biographical data sheet which was coded with a unique identifier; questions documented any prior work experience in a centralized nursing model, total number of years in nursing, number of years at this healthcare facility, age range, race, gender, and level of education (see Appendix E).
3. Participants completed the opposite side of the biographical data sheet which solicited their perceptions of the six research questions in relation to a centralized and a decentralized model of care (see Appendix F). A researcher collected the completed questionnaires.
4. Participants then wrote their names on a tent card and placed them on the table in front of them for discussion facilitation.

The researcher reiterated that participation was confidential and voluntary and read the focus group welcome sheet (see Appendix G). During the focus groups only, participants were identified by the name on each tent card. The focus groups were confidential with only first names, age category, gender, and job roles known by the researcher. The researcher requested specifically that participants respect others' privacy and maintain confidentiality of information discussed in the groups. All data was aggregated for reports, and no individual

identifying information was included. Individual names were not used in any results, reports, or publications.

The focus group format was semi-structured with flexibility for the facilitator to adjust and choose questions based upon participant responses. This number of groups was anticipated to be adequate to achieve saturation which was assessed toward the end of planned focus group data collection. If saturation had not been achieved, additional group(s) would have been scheduled. All groups were audio recorded to document the conversations accurately (see Appendix H).

Research Questions

The study qualitatively and quantitatively explored nurse perspectives regarding the inpatient medical-surgical unit design at two Midwestern acute-care hospitals. Both units have been redesigned from their previous centralized nursing station design to a decentralized nursing station design. Research questions were as follows:

1. What are nurses' opinions regarding the effects of a decentralized nurses' station regarding the quality of care for patients?
2. What are nurses' opinions regarding the effects of a decentralized nurses' station on professional and social communication?
3. What are nurses' opinions regarding the effects of a decentralized nurses' station on documentation?

4. What are nurses' opinions regarding the effects of a decentralized nurses' station on reducing the amount of perceived stress?
5. What are nurses' opinions regarding the effects of a decentralized nurses' station on nurses' perceived wellbeing in the work environment?
6. Do nurses believe that the method of transition from a centralized to decentralized nursing model impacts nurse work performance?

Data Management and Analysis

A qualified, CITI-trained transcriptionist transcribed the audio files to text documents in MS Word (see Appendix I). The researcher input text files into the qualitative data management software NVivo (QSR International, 2017) for data management and analysis. Qualitative data, along with demographic information collected, were stratified and analyzed thematically using NVivo. Coding and interpreting the data focused on identifying themes and categorical assignment of themes. The researcher reduced the data to "significant statements" from which themes and descriptions were constructed and then synthesized to an overall essence of the experience (Creswell, 2012). NVivo was used to categorize significant statements, sentences, and quotes and to develop clusters of meaning from themes.

For the five-point Likert scale questions regarding nurse's opinions on each of the six key research questions, the researcher descriptively summarized these results and triangulated them with the qualitative findings. The Likert scale

responses were coded to numerical values to allow for descriptive statistics (see Figure 4). The coded responses were entered into SPSS in order to compute descriptive statistics including n (sample size), mean, standard deviation, minimum, maximum, median, and the inter-quartile range for each of the 12 questionnaire items.

Figure 4. Questionnaire coding example

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Conclusion

This chapter described the quantitative and qualitative research methods used in conducting this study. Details included explanation of the hospital study sites, participant recruitment, data collection instruments, data collection procedures, and data analysis.

CHAPTER 4

Results

This study explored and compared perspectives and experiences of nursing staff working in a decentralized inpatient unit design. Investigation of nurse perspectives were completed through semi-structured focus group interviews with those who either experienced a transition from a centralized work environment to a decentralized unit, or who had experienced only a decentralized unit model for the first time. In addition to the focus group interviews, participants completed a paper-based survey to voice their opinions or attitudes on 12 measures. The responses were placed on a five-point Likert scale, from strongly disagree to strongly agree. This chapter organizes the results by research question, analyzing the qualitative and quantitative data for each question.

Demographics

In June and August 2017, the researcher conducted focus group interviews and questionnaires at Great Plains and Fremont hospitals, respectively. Table 2 describes the sample demographics and participants by several categories, showing frequency and percentage. The total sample consisted of 28 participants which included 14 registered nurses (RN's), seven managers, and seven ancillary clinical staff members. The majority (92.9%) was female.

Table 2

Demographic Characteristics of Participants (N = 28)

Characteristics	Fremont	Great Plains	n	%
Participants	9	19	28	100
Age Range				
26-35	3	8	11	39.3
36-45	2	4	6	21.4
46-55	3	4	7	25.0
56-65	1	3	4	14.3
Gender				
Female	8	18	26	92.9
Male	1	1	2	7.1
Ethnicity				
Asian	0	1	1	3.6
Caucasian	9	16	25	89.3
Hispanic	0	1	1	3.6
Other	0	1	1	3.6
Highest Degree Earned				
ADN	0	3	3	10.7
BSN	5	7	12	42.9
MSN	2	4	6	21.4
Non-nursing	2	5	7	25.0
Job Category				
RN	4	10	14	50.0
Management	3	4	7	25.0
Non-nursing	2	5	7	25.0
Years as RN				
1-4	1	4	5	17.9
5-9	1	2	3	10.7
10-14	2	4	6	21.4
15-19	1	0	1	3.6
20-24	0	1	1	3.6
25+	2	3	5	17.9
Non-nursing	2	5	7	25.0
Years at Current Hospital				
1-4	3	8	11	39.3
5-9	1	4	5	17.9
10-14	3	1	4	14.3
15-19	0	4	4	14.3
20-24	1	3	2	7.1
25+	1	1	2	7.1

Response Data

The analysis of the focus group responses to questions regarding the effect of decentralized nursing station design on the quality of patient care revealed a difference in perspective between staff and management. While the most prominent theme among nursing staff was time spent with the patient, management's most prominent theme focused on how the patient's environment impacts clinical outcomes.

Supports quality patient care. Staff at both facilities defined providing quality patient care as spending time with the patient. One staff member stated the importance of, "giving the patient the time that they need without rushing them, listen[ing] to what they have to say, actually spending the time with them… just a touch on the arm, on the hand, and listen[ing] to what they actually have to say." Another staff nurse elaborated on the satisfaction of, "Just having the time to spend with them and the time to look through their charting, your documentation, their history, and their meds. You know, to feel like you are actually prepared in giving them the best care that you can for the day." These statements reflected the nursing staff perspective that quality care means attention to the patients' human needs beyond just their medical needs.

In discussing how the environment impacts the amount of time spent with patients, the respondents expressed varying opinions. Some staff members believed that a decentralized unit design supports, and possibly compels, nurse-

patient interaction. One staff member stated that the decentralized nursing design “almost forces you to go spend more time in your patients’ rooms because you don’t feel that you need to go sit in the nurses’ station and be where everybody else is.” Another staff member expanded on this opinion by saying,

> I mean you’re right there. You are charting outside your room. You could look in and see if your patient is reaching for something, and you can just walk right in and help them, or family; you see them looking around in the room or they’re looking at the monitor, and they look puzzled. I mean, you can see all those things that you wouldn’t normally see if you weren’t just sitting right there charting. Those kinds of aspects have improved the care I provide, I think.

Yet the experiences detailed in the quotes above are not universal. In contrast, other staff at both hospitals expressed a different experience with the decentralized unit design stating, “You don’t have as much time to spend with your patient. You spend more time running around like crazy.” Another staff member commented, “I feel that we are always walking and trying to find things instead of having everything in one centralized place, and that takes all our time.”

Unlike staff who defined quality of patient care in terms of meeting a patient’s human needs, management at both facilities defined quality of care in terms of how the patient’s environment impacted clinical outcomes. One nurse leader stated, “The environment for the patient is very nice. It’s quieter. They

have a bigger space. They can see outside. It's more therapeutic for healing." Another manager added that, "highly acute patients benefit from the privacy, the decreased noise, and the stimuli for acute delirium, and all that good stuff."

When the nurse managers discussed the downfalls of the decentralized model, they commented, "If I have to go seek help out, I am probably not going to ask, and I'll just wing it as a new grad." This type of attitude could negatively impact quality of care.

Although most of the groups believed a centralized unit design better supported quality patient care, only the Fremont group stated that a centralized unit design was significantly better than a decentralized model (t = 3.578, p = 0.007). By comparison, the Great Plains group believed that a decentralized unit design was slightly better at supporting quality patient care (t = -0.815, p = 0.426). The nurses with less than 10 years of experience (New RN) and the participants over 55 years of age (Age Over 55) were the only other groups that stated a decentralized unit design was better at supporting quality patient care (mean differences -0.250 and -0.500, respectively) (see Table 3).

Although staff and management expressed differing opinions on what constituted quality care, little difference emerged in their opinions on the environment's impact. The most interesting finding was the differing views the two hospitals' staff members held on the role the environment played. Fremont participants expressed strongly that a centralized unit design resulted in better

quality care, while Great Plains participants indicated that a decentralized unit design was slightly better for improving quality of care.

Table 3

Paired t-Test Results for "Supports Quality Patient Care"

	Centralized		Decentralized				
Group	M	SD	M	SD	diff	t	p
All Participants (n = 28)	3.79	0.876	3.54	0.962	0.250	0.878	0.388
Freemont (n = 9)	4.33	0.500	3.00	1.000	1.333	3.578	**0.007**
Great Plains (n = 19)	3.53	0.905	3.79	0.855	-0.263	-0.815	0.426
BSN Degree (n = 12)	4.00	0.739	3.58	0.900	0.417	1.164	0.269
MSN Degree (n = 6)	3.83	0.983	3.50	1.378	0.333	0.378	0.721
RN (n = 14)	3.71	0.825	3.64	0.842	0.071	0.201	0.844
Management (n = 7)	4.00	1.000	3.43	1.272	0.571	0.760	0.476
Nurses (n = 21)	3.81	0.873	3.57	0.978	0.238	0.706	0.489
Other (n = 7)	3.71	0.951	3.43	0.976	0.286	0.505	0.631
New RN (n = 8)	3.50	0.926	3.75	0.886	-0.250	-0.475	0.649
Experienced RN (n = 13)	4.00	0.816	3.46	1.050	0.538	1.244	0.237
Age < 36 (n = 11)	3.82	0.982	3.82	0.874	0.000	0.000	1.000
Age = 36+ (n = 17)	3.76	0.831	3.35	0.996	0.412	1.100	0.288
Age = 55+ (n = 4)	3.25	0.957	3.75	0.957	-0.500	-0.522	0.638

Note. diff = Mean difference of Centralized – Decentralized

Supports professional and social communication. Investigating the effects of a decentralized nurse station model on professional and social communication, three types of communication were discussed: (a) nurse to nurse, (b) nurse to provider, and (c) nurse to patient. Nurse to nurse communication was the most frequently discussed type of communication,

accounting for almost half of the coded responses. Within nurse to nurse communication, two themes emerged: reliance on technology and teamwork. Within the nurse-to-patient analysis, communication and quality of care emerged as prominent themes.

With both hospitals having increased the overall size of their inpatient units, multiple staff members reported that with the increased size and decentralized design of the unit, staff members now relied on their phones to locate other staff, especially nurses, for assistance. One nurse stated, “There [are] a lot of phone calls. That is fatiguing when you are a nurse in the room trying to talk with the patient; you are getting a lot of phone calls interrupting care.”

One nurse commented, “I think it has been really hard to find people to help you when you need it. We rely on our phones a lot.” Staff expanded on this opinion by saying that simply finding people was much harder in the decentralized model and that they “worked more closely as a team in the old department,” citing more opportunities for interaction and communication. Fremont staff discussed the phone system not working in areas of the floor so that “you drop calls, or don’t get calls, making us look for help.”

Management from both facilities reported that communication had become a bigger issue than they expected when moving to the new decentralized unit design. One manager said, “I think we anticipated it. I’m not sure that we really

understood how much of an impact it was going to make. We knew it was going to be a challenge, but I think we underestimated it." Managers discussed how decreased nurse to nurse communication could impact care. One manager expanded by saying, "They're not seeing and talking to each other like, hey, can you help me out with this?" The managers echoed the staff's view on the volume of phone calls made. "The phones end up ringing to the charge [nurse] when no one picks them up, so you are busy calling other people to find help, or walking around which takes up our time and only exacerbates the problems." Another manager discussed her feelings on social communication and job satisfaction,

> Staff being satisfied with their job is a little bit about coworkers, camaraderie, and teamwork; so, for us, that is something we are always thinking about how to continue to foster, so they have the strong relationships with peers. Yeah, you don't want a lot of chitchatting going on, but chitchatting is what builds relationships to keep people: it is a fine line.

Great Plains management discussed that in the previous unit the rooms were not private, so nurses prepared their reports in the nurse station; therefore, other staff members were nearby so they conducted morning huddles to discuss the day's issues. In the new units, all patient rooms are private, and nurses would now complete their reports in the patient room. Since the nurses were not already together, they have neglected that habit of morning huddles. One

manager stated, “We’re just too busy to come and huddle up for 5 or 10 minutes, so we haven’t forced that issue, and I think communication has suffered because of it, in my opinion.”

Nurse to provider communication was also discussed by staff who described it as harder in the decentralized unit design because it was more difficult to see and find providers. One nurse noted that, “The physician will complain to you that they can’t find a nurse to round with.”

Respondents indicated that nurse-patient communication was better in a decentralized unit design. Several nurses noted how charting in the room gave them more opportunities to converse with the patent and the family; “You can sit there and chart and talk to your patient and get to know your patient.”

To investigate communication, the researcher asked participants to rate both professional and social communication. When considering professional communication, no discernable difference existed between the two hospitals in their preference of a centralized over a decentralized unit design. Only two groups, Others and Age 55+, failed to show significant differences, while the remaining categories were all significant at the alpha = 0.05 level (see Table 4). The largest mean difference appeared in the MSN category with ratings of 4.33 for centralized and 2.33 for decentralized.

Table 4

Paired t-Test Results for "Supports Effective Professional Communication"

	Centralized		Decentralized				
Group	*M*	*SD*	*M*	*SD*	*diff*	*t*	*p*
All Participants (n = 28)	4.18	0.612	2.57	0.836	1.607	7.296	**<0.001**
Fremont (n = 9)	4.33	0.707	2.44	0.882	1.889	4.857	**<0.001**
Great Plains (n = 19)	4.11	0.567	2.63	0.831	1.474	5.480	**<0.001**
BSN Degree (n = 12)	4.42	0.515	2.50	0.798	1.917	8.373	**<0.001**
MSN Degree (n = 6)	4.33	0.816	2.33	1.033	2.000	2.928	**0.033**
RN (n = 14)	4.21	0.426	2.36	0.745	1.857	8.039	**<0.001**
Management (n = 7)	4.57	0.787	2.71	1.113	1.857	3.122	**0.021**
Nurses (n = 21)	4.33	0.577	2.48	0.873	1.857	7.678	**<0.001**
Other (n = 7)	3.71	0.488	2.86	0.690	0.857	2.121	0.078
New RN (n = 8)	4.38	0.518	2.63	0.744	1.750	4.782	**0.002**
Experienced RN (n = 13)	4.31	0.630	2.38	0.961	1.923	5.839	**<0.001**
Age 35 and Under (n = 11)	4.45	0.522	2.82	0.603	1.636	5.285	**<0.001**
Age Over 35 (n = 17)	4.00	0.612	2.41	0.939	1.588	5.125	**<0.001**
Age Over 55 (n = 4)	3.75	0.500	2.50	1.000	1.250	1.667	0.194

Note. diff = Mean difference of Centralized – Decentralized.

No noticeable difference existed between professional and social communication when evaluating mean scores from both centralized and decentralized unit designs across all categories except the Age Over 55 group. When compared to professional communication, the Age Over 55 group's mean

score for social communication in a centralized unit design rose by half of a point from 3.75 to 4.25 while the mean score for a decentralized unit design fell from 2.50 to 2.00, resulting in a significant difference (t = 9.00, p = 0.003) (see Table 5).

Table 5

Paired t-Test Results for "Supports Effective Social Communication"

	Centralized		Decentralized				
Group	*M*	*SD*	*M*	*SD*	*diff*	*t*	*p*
All Participants (n = 28)	4.07	0.813	2.43	0.790	1.643	6.935	**<0.001**
Fremont (n = 9)	4.11	1.054	2.33	0.707	1.778	4.880	**0.001**
Great Plains (n = 19)	4.05	0.705	2.47	0.841	1.579	5.112	**<0.001**
BSN Degree (n = 12)	4.08	0.900	2.33	0.778	1.750	5.326	**<0.001**
MSN Degree (n = 6)	4.50	0.548	2.33	1.033	2.167	3.993	**0.010**
RN (n = 14)	4.00	0.784	2.36	0.842	1.643	5.056	**<0.001**
Management (n = 7)	4.71	0.488	2.29	0.756	2.429	8.167	**<0.001**
Nurses (n = 21)	4.24	0.768	2.33	0.796	1.905	7.684	**<0.001**
Other (n = 7)	3.57	0.787	2.71	0.756	0.857	1.686	0.143
New RN (n = 8)	4.13	0.641	2.38	0.744	1.750	4.249	**0.004**
Experienced RN (n = 13)	4.31	0.855	2.31	0.855	2.000	6.245	**<0.001**
Age 35 and Under (n = 11)	4.36	0.505	2.55	0.688	1.818	6.143	**<0.001**
Age Over 35 (n = 17)	3.88	0.928	2.35	0.862	1.529	4.443	**<0.001**
Age Over 55 (n = 4)	4.25	0.500	2.00	<0.001	2.250	9.000	**0.003**

Note. diff = Mean difference of Centralized – Decentralized.

With respect to both professional and social communication, staff reported that communicating with each other and providers was easier and more prolific in a centralized unit design as compared to a decentralized design. Survey results confirmed that staff in both hospitals scored a centralized unit design higher than a decentralized unit design.

Supports nurses' chart documentation. Regarding documentation within the new decentralized nursing environment, two themes emerged from the analysis of the focus groups' responses: (a) in-room charting and (b) charting in the hallway at the decentralized workstations between rooms. These themes revealed how the decentralized nursing model facilitated documentation time management. Staff preference for in-room or bedside charting related to nurse convenience, time management, and providing quality care. When discussing why and when charting in the room was preferred, staff responded, "I think most of our charting occurs there, I would say. It's easier to stay caught up, you know if you're in the room, you just chart it and document it in real time." Another staff replied, "I really enjoy charting at the bedside, too. I think it helps. I think it is more accurate charting." Other staff added,

> I'm a big advocate of charting in the room; chart in your room and you are going to get distracted less, and people are going to ask you to do things less. I'll come up, "Hey, how's it going? Is everything going okay? Do you have any questions about anything?' And then they stop charting and

start talking, and I start talking and then they don't get their charting done. But if you're in [the patient] room, I don't go and bother people in a room.

As these quotes revealed, the decentralized nursing design with computers in each room afforded nurses and other staff the opportunity to be efficient in their documentation, a crucial task in nursing. The majority of the focus group participants said they frequently engaged in bedside charting and were very satisfied with computer workstations in each patient room. "We used to chart, I think, in the nurse station most of the time. Now, I think most of our charting occurs there [at the bedside], I would say." The convenience of computers in the patient room allowed nurses to improve accuracy, stay on top of all their charting duties, and communicate and interact with their patients. As discussed previously, nurses expressed that they provide quality patient care when spending time with patients. Bedside documentation supports the kind of nurse-patient communication and interaction that the nurses believed reflected high-quality patient care.

Nurses also stated satisfaction with charting in the hallway at the between-room nursing alcoves. When discussing why and when charting in the hall was preferred, one staff member stated, "I'll finish up on the outside of the room at those computers, so I don't bother the patient." Again, this quote indicated the way the nurses in the focus groups prioritized patients and quality patient care. Focus group participants spoke about the elements of the environmental design

in the two studied units which allowed them flexibility in their charting—they chart in the patient room most of the time to stay on task while communicating with patients, but they also chart at the hallway alcoves to allow patients privacy and undisturbed healing or sleep.

Additionally, the hallway nursing alcoves seemed to support nurses' physical well-being by offering a place to rest briefly while completing documentation. Staff commented on the comfort of hallway charting stations, stating, "you can sit down for your longer stuff."

When asked to compare charting in a decentralized unit design compared to the previous centralized unit design, staff noted, "In the old tower you wrote everything down on a piece of paper and then when you got a computer, you charted it all, which is mostly after your shift was over, which isn't good." Other staff said, "Yeah, we chart more frequently in a decentralized unit design." This qualitative data expressed the general consensus among nurses that the decentralized nursing model improved the ease and efficiency of documentation tasks, as also supported by the quantitative analysis of survey results.

Of the seven categories investigated, Supporting Patient Documentation emerged as the only category where the majority of the groups believed a decentralized unit design was better. As with most categories, the Fremont staff (mean difference of -0.667) reported with a larger difference of opinion than Great Plains (mean difference of -0.368). Both the Management group and the

Other group indicated that both unit designs were equal, and the RN group produced the only significant result (t = -3.789, p = 0.002) (see Table 6).

Table 6

Paired t-Test Results for "Supports Patient Documentation"

	Centralized		Decentralized				
Group	*M*	*SD*	*M*	*SD*	*diff*	*t*	*p*
All Participants (n = 28)	3.57	0.836	4.04	0.838	-0.464	-1.788	0.085
Fremont (n = 9)	3.44	0.882	4.11	0.601	-0.667	-1.512	0.169
Great Plains (n = 19)	3.63	0.831	4.00	0.943	-0.368	-1.129	0.274
BSN Degree (n = 12)	3.58	0.996	4.25	0.622	-0.667	-1.876	0.087
MSN Degree (n = 6)	3.50	1.049	3.83	0.983	-0.333	-0.415	0.695
RN (n = 14)	3.43	0.852	4.36	0.497	-0.929	-3.789	**0.002**
Management (n = 7)	3.71	1.113	3.71	0.951	<0.001	<0.001	1.000
Nurses (n = 21)	3.52	0.928	4.14	0.727	-0.619	-2.033	0.056
Other (n = 7)	3.71	0.488	3.71	1.113	<0.001	<0.001	1.000
New RN (n = 8)	3.75	1.035	4.25	0.707	-0.500	-1.080	0.316
Experienced RN (n = 13)	3.38	0.870	4.08	0.760	-0.692	-1.671	0.121
Age 35 and Under (n = 11)	4.09	0.539	4.18	0.751	-0.091	-0.289	0.779
Age Over 35 (n = 17)	3.24	0.831	3.94	0.899	-0.706	-1.900	0.076
Age Over 55 (n = 4)	2.75	0.957	4.50	0.577	-1.750	-2.782	0.069

Note. diff = Mean difference of Centralized – Decentralized.

From the focus group and survey responses, a preference emerged for charting in a decentralized unit design. The only significant value was the RN group, and within this group the Over Age 55 group rated decentralized higher than the other groups.

Effects their perceived stress. Two issues arose from the analysis of the discussion focused on the ways decentralized nursing unit design affects nurses' perceived levels of stress. The first issue that was a major cause of stress among nurses was their inability to find other staff and frequently needed supplies. The second major stressor was the amount of change that took place.

Staff repeatedly expressed frustration with not being able to find either people or supplies, as illustrated in the following statements: "It can take ten minutes to find somebody!" and, "Where is everybody?" Other staff responded by saying, "It gets frustrating when you can't find anyone," and "You feel like you're completely by yourself." Searching for help and supplies caused the nurses angst in general, but especially when it interfered with, or adversely affected, caring for their patients. Staff stated, "It's almost like you need one person to be the runner to get everything for everyone." Other staff described how looking for supplies for such a long time made their patients have a negative experience, or wonder if the nurse was coming back. One staff member stated, "I guarantee you, when something bad happens, no one is going to be around to

help." Another went on to say, "I feel bad when I see other nurses having a hard time, having a really busy assignment, and no one knows so we can't help."

The other issue that staff reported as a major stressor related to the amount of change that occurred when transitioning to a decentralized nursing unit model. Staff stated it was "too much change at once." Further, staff expanded on this by saying, "We were all so inundated with all the new technology of the building. You can't remember everything when you've got so much stuff being thrown at you at once. It's overwhelming."

All groups believed the centralized unit design did a better job of supporting the management of their stress levels. As with every category other than the two communication categories (see Table 7), the Fremont participants' mean difference (1.444) was substantially larger than the Great Plains participants' mean difference (0.737). While the Age Over 55 group ($t = 0.775$, $p = 0.495$) believed both unit designs were roughly the same and both the Other ($t = 1.082$, $p = 0.321$) and MSN ($t = 1.865$, $p = 0.121$) groups had non-significant results, the remaining groups all believed the centralized unit design to be significantly better than the decentralized unit design at supporting their management of their stress levels. Eight of the groups had highly significant results (see Table 7).

All participants voiced an increase in their perceived stress level with not being able to find people and in the shear amount of change that was taking

place all at one time. This sentiment is expressed in the survey results as well with most all groups significantly favoring a centralized unit design to help manage their stress levels.

Table 7

Paired t-Test Results for "Supports Management of My Stress Level"

	Centralized		Decentralized				
Group	*M*	*SD*	*M*	*SD*	*diff*	*t*	*p*
All Participants (n = 28)	3.75	0.844	2.79	0.686	0.964	4.143	**<0.001**
Fremont (n = 9)	4.11	0.333	2.67	0.707	1.444	5.965	**<0.001**
Great Plains (n = 19)	3.58	0.961	2.84	0.688	0.737	2.348	**0.031**
BSN Degree (n = 12)	4.00	0.603	2.75	0.622	1.250	5.000	**<0.001**
MSN Degree (n = 6)	4.00	0.632	2.67	1.211	1.333	1.865	0.121
RN (n = 14)	3.79	0.699	2.79	0.579	1.000	3.894	**0.002**
Management (n = 7)	4.00	0.577	2.71	1.113	1.286	2.121	0.078
Nurses (n = 21)	3.86	0.655	2.76	0.768	1.095	4.256	**<0.001**
Other (n = 7)	3.43	1.272	2.86	0.378	0.571	1.082	0.321
New RN (n = 8)	3.88	0.835	2.88	0.641	1.000	2.646	**0.033**
Experienced RN (n = 13)	3.85	0.555	2.69	0.855	1.154	3.248	**0.007**
Age 35 and Under (n = 11)	3.82	0.751	2.91	0.539	0.909	3.194	**0.010**
Age Over 35 (n = 17)	3.71	0.920	2.71	0.772	1.000	2.915	**0.010**
Age Over 55 (n = 4)	3.75	0.957	3.25	0.500	0.500	0.775	0.495

Note. diff = Mean difference of Centralized – Decentralized.

Effects their perceived wellbeing. Walking, and the physical fatigue from walking, were the prominent themes that arose from the focus group discussion regarding the effects the new unit design had on nurses' perceived wellbeing in their work environment. There was a consensus among all nursing staff focus groups that the decentralized unit demands more walking in comparison to the centralized design. "There is a lot more walking." "It is just a very long walk since everything is so spread out." "I think a lot more people have complained that their legs and feet hurt so much more."

The above responses exemplify the common theme expressed by the staff members about how much more walking they do on shift, and consequently, the increased level of fatigue they feel at the end of the day. Much of the increased walking during shift seems attributable to the increased size of the unit and the difficulty the staff has with finding people and supplies.

The Age Over 55 group (mean difference = 0.00) was the only group that did not think a centralized unit design was better than the decentralized unit design at supporting staff health and wellbeing. The mean difference of the Fremont group (1.556) was significant (t = 5.292, p = 0.001) and almost ten times as large as the non-significant (t = 0.645, p = 0.527) Great Plains group mean difference (0.158). The All Participants group (t = 2.684, p = 0.012), the BSN Degree group (t = 2.727, p = 0.020), the RN group (t = 2.917, p = 0.012), and the

Nurses group (t = 2.646, p = 0.016) all believed the centralized unit design was significantly better at the alpha = 0.05 level (see Table 8).

Table 8

Paired t-Test Results for "Supports My Health and Wellbeing"

	Centralized		Decentralized				
Group	*M*	*SD*	*M*	*SD*	*diff*	*t*	*p*
All Participants (n = 28)	3.68	0.819	3.07	0.813	0.607	2.684	**0.012**
Fremont (n = 9)	4.11	0.333	2.56	0.726	1.556	5.292	**0.001**
Great Plains (n = 19)	3.47	0.905	3.32	0.749	0.158	0.645	0.527
BSN Degree (n = 12)	4.08	0.515	3.17	0.937	0.917	2.727	**0.020**
MSN Degree (n = 6)	3.50	0.837	3.17	0.753	0.333	0.598	0.576
RN (n = 14)	3.86	0.663	3.00	0.877	0.857	2.917	**0.012**
Management (n = 7)	3.57	0.787	3.29	0.756	0.286	0.603	0.569
Nurses (n = 21)	3.76	0.700	3.10	0.831	0.667	2.646	**0.016**
Other (n = 7)	3.43	1.134	3.00	0.816	0.429	0.812	0.448
New RN (n = 8)	3.75	0.707	3.00	0.926	0.750	2.049	0.080
Experienced RN (n = 13)	3.77	0.725	3.15	0.801	0.615	1.760	0.104
Age 35 and Under (n = 11)	3.82	0.603	3.27	0.786	0.545	1.936	0.082
Age Over 35 (n = 17)	3.59	0.939	2.94	0.827	0.647	1.952	0.069
Age Over 55 (n = 4)	3.25	0.957	3.25	0.957	<0.001	<0.001	1.000

Note. diff = Mean difference of Centralized – Decentralized.

Respondents from both hospitals commented very often and at length about the additional walking required in the new decentralized unit design. However, this comment was not as significantly reflected in the survey results.

Transition from a centralized to decentralized model. Nursing staff focus groups were asked if the method of transition from a centralized to decentralized nursing model impacts nurse work performance. Two themes emerged from the analysis of staff and management's responses. Responses focused either on the operational transition or the physical transition to a new environment.

Operational transition included planning the new environment, education about the new environment, and future state operations. When respondents recounted their involvement in planning the new space, those that were employed during that process spoke of not having input in the design or the transition planning. The following quotes illustrate this sentiment: "This is the way it's going to be set up (decentralized). End of discussion," and "I think it was more told that it was happening rather than explained, taught, or problem solved." Other staff expressed some feeling of resentment toward the new design, implying that it was implemented to keep nurses on task and to reduce socializing. "Basically, what it was is that they didn't want people to congregate," "You don't have a nurse's station, you have a communication center. We just changed the name, so nurses aren't supposed to hang out there," "People aren't

supposed to sit and talk because it's noisy, plus you are burning time. You need to be getting work done. That is kind of what their thought process was."

The above quotes reflect a skepticism towards management's intention for implementing the change to decentralized nursing. Further, these sentiments reveal a lack of understanding of any potential benefit decentralized nursing design could offer which may imply a lack of communication on management's part to include staff in the decision-making process.

Comments from nurse managers suggested they recognized a greater need for staff involvement in the transition process. As one nurse leader commented, "You need to have the engagement of staff at the beginning, being at the table and talking about it." Other managers echoed this insight, saying that, in hindsight, "it [transition planning] needed way more emphasis than what we probably gave it." When managers discussed their attitudes around the operational changes, and communicating with staff about the change, the prevailing sentiment was to "get them more involved in the conversations. Maybe they would have accepted the culture and embraced it. They didn't know and understand really what this was going to feel like, and so it was a culture shock. The shock resulted in frustration, some tears, and some people leaving because they just couldn't deal with it."

When discussing the education and operational preparation completed prior to the transition from centralized to decentralized nursing units, all staff and

management groups recounted tours, scavenger hunts, and new equipment training. One manager stated, “They would go through some of the normal day of a nurse in ICU: admitting a patient, discharging, transferring, running codes.” When considering the preparation for future state operations, both groups felt they were unprepared for the change that happened. Staff recalled, “I don’t think there were any strategies or any preparation for how things [operations] would be,” along with, “I don’t think we really knew what that was until we actually got over here, and it was like, oh wow.”

Pertaining to the actual moving of patients and equipment to the new environment, all participants were pleased with how smoothly it went. One staff member said, “That was the easiest part.” One of the managers described, “We had a team looking at how we were going to move from one place to the other. They were meeting like every two weeks, talking about the whole move process, and a whole book was written for that [the move] and a whole team was formed.”

Both hospital staffs discussed not being prepared to work efficiently in the new facility, while nurse managers believed they were preparing staff for this transition. When reflecting on the change in environment, management recalled that it was quickly evident that they had not done enough preparation. When the physical transition was discussed, all staff at both facilities commented on how smooth the process was and how much communication and preparation was done prior to the move.

After examining the responses across all groups and computing t-tests on the difference in means between the centralized unit design and decentralized unit designs for all seven 5-point Likert scale questions, some interesting patterns emerged (see Tables 9 and 10). The group as a whole (All Participants) had significant results on all but two questions. In fact, those two questions (Supports Quality Patient Care and Supports Patient Documentation) were non-significant for all but one group each. The Other group had non-significant results for every question at both hospitals. The Age Over 55 group was only significant for the Supports Social Communication question. Both the MSN Degree and Management groups were non-significant for every question except for the two communication questions (Supports Professional Communication and Supports Personal Communication), in which a centralized environment was preferred. Differences identified in the two communication questions were significant for every group except the Other group and Age Over 55 group. The Fremont group was significant for every question except Patient Documentation. The Great Plains group was only significant on the two communications questions and the Supports Management of My Stress Level question. Every group had no preference or preferred the decentralized unit design for supporting patient documentation. All other groups preferred the centralized unit design for all other questions. When choosing a preferred work environment, 27 of the 28 respondents stated they preferred a centralized unit design.

Table 9

Paired t-Test Significance Level for All Likert Questions from All Groups

Group	Patient Care	Professional Communication	Social Communication	Patient Documentation	Stress Level	Wellbeing	Work Performance
All Participants (n = 28)	N.S.	.000	.000	N.S.	.000	.012	.017
Fremont (n = 9)	.007	.001	.001	N.S.	.000	.001	.002
Great Plains (n = 19)	N.S.	.000	.000	N.S.	.031	N.S.	N.S.
BSN Degree (n = 12)	N.S.	.000	.000	N.S.	.000	.020	.015
MSN Degree (n = 6)	N.S.	.033	.010	N.S.	N.S.	N.S.	N.S.
RN (n = 14)	N.S.	.000	.000	.002	.002	.012	.017
Management (n = 7)	N.S.	.021	.000	N.S.	N.S.	N.S.	N.S.
Nurses (n = 21)	N.S.	.000	.000	N.S.	.000	.016	.018
Other (n = 7)	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
New RN (n = 8)	N.S.	.002	.004	N.S.	.033	N.S.	.049
Experienced RN (n = 13)	N.S.	.000	.000	N.S.	.007	N.S.	N.S.
Age 35 and Under (n = 11)	N.S.	.000	.000	N.S.	.010	N.S.	N.S.
Age Over 35 (n = 17)	N.S.	.000	.000	N.S.	.010	N.S.	N.S.
Age Over 55 (n = 4)	N.S.	N.S.	.003	N.S.	N.S.	N.S.	N.S.

Note. N.S. means the result was not significant at the alpha = 5% level

Table 10

Mean Differences for All Likert Questions from All Groups

Group	Patient Care	Professional Communication	Social Communication	Patient Documentation	Stress Level	Wellbeing	Work Performance
All Participants (n = 28)	0.250	**1.607**	**1.643**	-0.464	**0.964**	**0.607**	**0.750**
Fremont (n = 9)	**1.333**	**1.889**	**1.778**	-0.667	**1.444**	**1.556**	**2.000**
Great Plains (n = 19)	-0.263	**1.474**	**1.579**	-0.368	**0.737**	0.158	0.158
BSN Degree (n = 12)	0.417	**1.917**	**1.750**	-0.667	**1.250**	**0.917**	**1.083**
MSN Degree (n = 6)	0.333	**2.000**	**2.167**	-0.333	1.333	0.333	0.667
RN (n = 14)	0.071	**1.857**	**1.643**	**-0.929**	**1.000**	**0.857**	**0.929**
Management (n = 7)	0.571	**1.857**	**2.429**	0.000	1.286	0.286	0.714
Nurses (n = 21)	0.238	**1.857**	**1.905**	-0.619	**1.095**	**0.667**	**0.857**
Other (n = 7)	0.286	0.857	0.857	0.000	0.571	0.429	0.429
New RN (n = 8)	-0.250	**1.750**	**1.750**	-0.500	**1.000**	0.750	**0.625**
Experienced RN (n = 13)	0.538	**1.923**	**2.000**	-0.692	**1.154**	0.615	1.000
Age 35 and Under (n = 11)	0.000	**1.636**	**1.818**	-0.091	**0.909**	0.545	0.545
Age Over 35 (n = 17)	0.412	**1.588**	**1.529**	-0.706	**1.000**	0.647	0.882
Age Over 55 (n = 4)	-0.500	1.250	**2.250**	-1.750	0.500	0.000	0.250

Note. A positive difference indicates a higher mean score for Centralized Unit Design, and a negative difference indicates a higher mean score for Decentralized Unit Design. Results in bold were statistically significant.

The results show that the centralized unit design was preferred by most of the groups for every research topic except for patient documentation. It makes sense that having multiple computer stations throughout the unit would facilitate better and easier patient charting. Even though several studies have shown the advantages of a decentralized unit design, these respondents felt strongly that the centralized unit design was superior and preferred by all but one respondent.

CHAPTER 5

Discussion

The healthcare industry faces a continued shortage of nursing professionals, and the national average turnover rate for bedside nurses is 17.2% and climbing (2016 National Healthcare Retention & RN Staff Report, 2017). Healthcare institutions are looking for ways to increase productivity, maximize patient satisfaction, and decrease errors, while minimizing staff attrition. Now more than ever, healthcare institutions are looking towards evidence-based design to guide inpatient design in order to improve work environments and patient outcomes (Ulrich & Zhu, 2007).

The purpose of this research was to explore, document, and compare nurse perspectives and experiences in two Midwestern community hospitals that recently transitioned from a centralized to a decentralized inpatient unit design. The researcher investigated how the design of inpatient units can address the industry imperatives to increase staff efficiency, satisfaction, and retention, as well as ultimately to improve the health and well-being of both patient and staff populations. Data collection consisted of six focus groups, four at Great Plains Health and two at Fremont Health, with a total of 28 participants. During the focus groups, staff members were asked to discuss their attitudes and opinions

regarding several areas of experience. In conjunction with the discussion, the participants were asked to complete a questionnaire with basic demographical data as well as 12 Likert scale questions to determine their opinion on centralized and decentralized unit designs.

Limitations

For each hospital, the goal was to have at least two groups of six to ten staff nurses each and one group of four to eight nurse managers in each of the focus groups. All staff members that signed up took part in the focus group. Although the number of total participants was less than the researcher expected, saturation was achieved in all groups. The researcher was asked by one hospital not to offer a gift card as an incentive for participation; therefore, no gift cards were given to any participants at either hospital. Lunch, refreshments, and desserts were provided for all participants at each hospital.

The Great Plains Hospital participant goal was a total of 12-20 staff and four to eight managers. In actuality, there were 15 staff and four managers. Staff members seemed happy to participate, most were self-selected, and only a few were asked to attend by management because they had worked at the facility when it was being designed and after the move. The participants were very open during the discussion and freely stated their own observations and opinions. All inpatient nursing units had representatives among both the staff and management focus groups.

The Fremont hospital participation goal was 12-20 staff and four to eight managers as well. The turn-out was almost half of Great Plains with six staff and three managers. Staff members had not volunteered for the focus group, so hospital leadership asked various representatives to attend and discuss their thoughts. While these participants lacked self-selection, they did represent all inpatient units. The researcher speculates that the lack of more participants was due to staff members' beliefs that their input was not valued during the design process, and they did not expect anyone to value their opinions now either.

Hypothesis Findings

Despite the relatively small sample size of 28, the quantitative survey produced highly significant results of differences in preference for the unit types. For almost all questions, the participants responded nearly the exact same way on each on the twelve questions. Overall, the only significant preference for a decentralized unit design was from the Registered Nurse category regarding the support of patient documentation. All other significant results supported the preference of a centralized nursing unit design, with nearly all groups having a significant preference for supporting social and professional communication (see Table 10). The last question on the questionnaire asked participants to choose between centralized and decentralized unit design as their preferred work environment. Only one of the participants preferred a decentralized unit design.

Supports quality patient care. With staff members from both hospitals emphasizing time as the key to providing quality care and improving patient outcomes, only the Fremont staff members believed strongly about the impact the environment played. Previous research described quality care as being reflective of advocacy, caring, empathy, intention, respect, and responsibility (Burhans & Alligood, 2010). The researcher believes the nurses at these institutions were drawing on these same characteristics in their response regarding care quality. Staff members answers about spending time with the patient can be interpreted as a measure of caring, respect, and empathy.

Several studies have suggested that nurses in decentralized nurse stations spend more time on patient care (Gurascio-Howard & Malloch, 2007; Hendrich et al., 2008; Hendrich, Fay, & Sorrells, 2004; Ulrich, 2006). The participants talked about a decentralized environment lending to spending more time with the patient, but on the questionnaire, they slightly preferred a centralized model for increasing quality of care.

Supports professional and social communication. Communication has long been a focus when discussing the change from a centralized design to a decentralized design. Communication is such a crucial element in the care of patients that the Joint Commission ranked it as the second most important area of focus in the Hospital National Patient Safety Goals for 2017 (Joint Commission, 2017). According to the data collected, nursing staff from both

hospitals reported communicating with each other, as well as with providers, and support staff was viewed as being improved in a centralized unit design as compared to a decentralized unit design.

Staff members repeatedly noted that communication was easier and more abundant when working in a centralized unit design. Staff recounted that finding people was easier and that they congregated together more often, leading to impromptu discussions around patient care. Nursing leaders discussed this and believed they no longer created opportunities for staff to come together to discuss issues or form “teams” or “buddies.” Therefore, the staff members come in and do their own thing. These findings are in accordance with previous research, (Tyson, 2002) showing there are feelings of being alone and not being able to find help. Nurses have also reported feeling isolated, and they find teamwork and communication more difficult.

Mobile phones that are meant to increase communication and should be utilized when needing others’ help are at times seen as a distractor to care. Staff members at both facilities stated they receive countless calls every day, far more than they did in their previous centralized inpatient units. Discussion around alarm fatigue has been a growing topic in healthcare, and phone fatigue may become, if not already is, a concern for patient and staff safety. With no one to consult for help, nurses feel that they are isolated and are forced to walk around searching for others since nurses now tend to not answer their phones.

Supports nurses' chart documentation. Data gathered from both the focus groups and questionnaires suggested a preference for charting in a decentralized unit design that was only significant for the Registered Nurse group. The decentralized nursing model has been associated with increased frequency of charting and documentation (Pati et al., 2015). Similar responses occurred in these focus groups as well. Many of the staff members noted that having more computers available allowed them to chart more frequently instead of having to share a few computers in the central nurse station or standing and charting in the hall at a wheeled workstation. Staff members appreciated that they could sit and chart in the hall with minimal interruptions instead of having to bring a mobile computer workstation into the room to chart.

The Peat Marwick study (1988) found that moving a full-function terminal to the bedside resulted in improved delivery of quality patient care. These nursing units with bedside terminals reported a decrease in errors of omission, greater accuracy and completeness of documentation, a reduction of medication errors, more timely response to patient needs, and improved discharge teaching. Staff members reported in the discussions that they charted far more frequently at the bedside, and their charting has improved in timeliness, accuracy, and completeness. These are all issues that healthcare facilities consider when trying to decrease liability risks.

Effects their perceived stress and wellbeing. Stress can come in many ways, and for these two hospitals that underwent a large operational change, it came in how staff handled the change and its consequences, specifically the emotional stress of not being able to find people and the physical stress of having to traverse this geographically enlarged area. This view is expressed in the survey results as well with most all group members significantly favoring a centralized layout to help manage their stress level.

Layout is a key determinant of staff walking distances and proximity to patients (Malkin, 2006), which has been associated with staff fatigue (Reiling, 2006). Staff members from both hospitals remarked repeatedly and in detail about the amount of additional walking they were doing in the new decentralized layout, which was not as significantly reflected in the survey results. Nurses commented that they could always find someone at the nurses' station in a centralized model whenever they needed to ask a question or get help in a patient's room. However, stress levels increased with the new decentralized unit design because nurses remarked that they ultimately had to walk around the unit trying to find someone to help since other nurses usually failed to answer their phones. Staff voiced concern regarding being able to get help when it was not emergent, and they were even more fearful that in an emergency it could be just as hard to get help.

Transition from a centralized to decentralized model. Transitioning occurred not only in the physical geographical move, but also in an operational one. Staff members from both hospitals discussed not being involved in the decision to move to a decentralized unit design. Further stress came after the move with not having a plan as to how they would work in the new unit design. The focus groups consisted of some staff that took part in programming and planning the new unit. When this topic was discussed, staff reported that the decision to move to a decentralized unit design had already been made, and it was not a point for discussion. Staff members repeatedly voiced the sentiment that they would have preferred to be involved in the decision. When the researcher asked if they would have suggested an alternative design, the vast majority said not really, or perhaps they would have suggested at least a small nurse station, but most all would have favored the current decentralized unit design. This researcher concluded that even though the decision would have been the same, the nurses believed that since it was their environment that was being changed, they should have been allowed to offer input on how to function in the space. Therefore, when operations broke down, staff were quick to blame management rather than rallying together to formulate a solution, thus leading to staff resignations. Real et al. (2016) had similar results that suggested hospitals needed to address organizational change by managing nurse expectations and changing socialization and communication practices.

When discussing the operational transition, one hospital administrator reported having a binder full of future state flow maps. When this topic was discussed with the staff members, it seemed they believed management had done little preplanning about how things were to operate, and they felt that they were, “Flying by the seat of our pants” as one staff member stated. When discussing how nurses would communicate, document, and even find supplies in the new facility, nurses felt that there was little effort put in by management to prepare them for these changes. A key finding in this study is that many nursing-related processes did not change in concert with major systematic changes which was another key finding in research conducted by Real et al. (2016).

Both facilities used a phone system and planned on relying mainly on that for communication between nurses and other staff. There was no thought about how the phone system would actually work for managers; they assumed it was a reliable system and it would continue. After the move, the nurses were inundated with calls and consequently started to not answer their phones. Additionally, nurses were experiencing more dead areas where they were not even able to receive a signal. Both hospitals had a call light system as well, but when activated within the room to signal for help, the nurse’s own phone rang with no back-up or roll-over number being called. This theme of frustration related to not having help emerged in previous focus group meetings as staff discussed the increase in perceived stress in the new decentralized unit design.

During focus group discussions with nursing managers, they acknowledged that they thought they were doing enough to prepare the nurses for the change, but they quickly realized that was not the case. When asked by the researcher what advice they would give to managers at another facility planning a similar change, the managers said, “involve them [staff] in meetings,” “get them [staff] closer to the process,” “involve them [staff] with figuring out how they will change,” “talk more about the future state,” and “try to change as much as you can before you move.”

When the staff and management recounted the physical move, all reported that it went smoothly and was viewed as being the easiest part. The ease in the physical transition could be attributed to the many staff-lead teams from each department who met on a regular schedule to plan each step of the move. This planning started early, nearly a year before the actual move, and was planned to the smallest detail. When comparing the operational transition to the physical transition, one staff member stated, “Too bad we didn’t plan for everything else [operations] as well as the move.”

Implications—Design Recommendations

Design should facilitate the amount of time caregivers can spend with their patients. In order to increase quality patient care, wasted time spent looking for and gathering supplies, medications, and even other people could be better spent with patients. Design also needs to foster communication between

colleagues and patients. With private rooms, care providers and patients feel more comfortable discussing private issues leading to more thorough and holistic care. The caregiving team needs to be able to access one another for physical help, answering questions, and connecting on a human level. Design should encourage communication and multidisciplinary care.

As inpatient nursing units continue to expand, efforts need to be made to ensure that staff members are not asked to walk endless miles a day to provide care. Bringing essential care items closer to the patient and having technology do more of the “heavy lifting” will decrease the stress placed on the body. Medicine is ever changing, but the ability of staff to adapt easily to these changes is key in decreasing the psychological and emotional stress in caregivers. Taking care of sick people has an inherent amount of stress associated with it, and the environment should not add to this stress by making it more difficult to find someone to double check a medication, or answer a procedural question.

When designing a new work environment, it may not be realistic or feasible to get a complete buy-in of the staff on a new operational model. This study and other research has shown the importance of involving the staff when configuring a future environment. It is important to document accurately the reasoning behind decisions and how the new environment was designed to operate. Recognizing operational changes that will be taking place in the new environment and identifying those changes that can be made in advance is

helpful with not overwhelming staff with change in the new facility. Whether that is the way supplies and equipment flow through the unit to developing mew communication techniques and habits. Taking time to discuss with staff how work will operate differently in the new environment and how best practices will be ensured are at the core of successful transitions.

Recommendations for Further Study

While this study provided some interesting insights into the attitudes and opinions of nurses changing from a centralized to a decentralized unit design; these types of environmental changes provide challenges as well as benefits. This study was limited to two small hospitals in rural Nebraska with a total of 28 participants. The researcher recommends conducting further studies across multiple healthcare facilities with a larger number of participants at each hospital.

Since communication emerged as a common theme being viewed as improved in a centralized unit and challenging in a decentralized design, this researcher suggests examining ways to communicate with other staff in a way that is Health Insurance Portability and Accountability Act (HIPAA) compliant. Healthcare providers struggle with being able to share information in a timely, secure, and private manor. Studying various technologies other industries use when private interpersonal communication is of vital importance may offer insight into new healthcare approaches.

Hospital reimbursement is tied to Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey scores where consumers grade the care they received. Several of the survey questions address the topics discussed in this paper, specifically nurse to patient and nurse to provider communication, environmental noise, and care provider responsiveness. The researcher recommends obtaining HCAHPS scores before and after changing unit designs. This approach would offer insight as to how patients believe the change in the inpatient unit design impacted their care.

One commonality between both hospital groups in this study was the challenge of transitioning to a new work flow and how it created feelings of being unprepared and overwhelmed. This researcher would recommend studying methods of preparing staff for operational change. Two key factors to consider are how to successfully incorporate a large number of staff in early design meetings, and how best to document the operational decisions that are made.

Conclusions

This research on nurse perspectives of the work impacts of decentralized nurse stations has revealed that personal and professional communication is a recurrent challenge. Conversely, the ability to chart close to the patient was considered beneficial. Staff members preferred a centralized layout in all but one of the survey items. When asked to choose a preferred work environment, all but one respondent chose a centralized nursing unit.

The researcher was not surprised with the overall preference of a centralized unit design. The surprising result was the unanimous nature in which the participants answered most of the questions. The researcher would have predicted a greater variety of responses to each of the survey questions.

The most unanticipated finding was the repeated sentiment that although the staff would have made the same decision to choose a decentralized unit design; the staff was upset by the sense that their opinion was not of value. Ironically, one of the themes that emerges from the management groups at both hospitals was the need to increase staff involvement. Managers suggested involving staff as early as possible in the process. The researcher would suggest using champions or leaders from the hospital to disseminate the information from the user meeting discussions to all staff members. As it takes years between the time a hospital is designed and when it is built, staff turnover will most likely occur. As suggested by management at both hospitals, the researcher agrees that documenting how and why decisions are made will inform future users about the operational foundations of the new design.

As a nursing shortage threatens, hospital leaders must focus on the environment in which their employees function. This at least should start with the design process for the facility. The value hospital leaders place on their employees and their job satisfaction will be rewarded with an increase in employee commitment and engagement. This study revealed that the process of

changing to a new unit design is difficult when staff members believe their opinions are not of value or their involvement in the process is viewed as unnecessary. As healthcare leaders seek to change their culture through the design of a new facility, it is imperative to have staff champions disseminate and gather information that is vital to the project. If healthcare leaders want to attract and retain the best employees, the employees must feel heard and valued from design throughout the entire design process.

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APPENDIX A

Volunteer E-mail

TO: Nursing Staff Distribution List

SUBJECT: Focus Group Research

Dear _____,

HDR Architecture, in cooperation with ***Organization Name***, would like to invite you to participate in a research study to gather feedback from employees about your workplace environment. We are interested in hearing about your experiences working in the new facility. The information gathered from the focus group discussions will be consolidated to help inform future facility planning, operational improvements, and hospital design. You are being asked to participate because of your first-hand knowledge as an employee who works in a nursing role at ***facility name***.

If you decide to participate we will arrange for you to join a focus group discussion with 6 – 10 other co-workers. This discussion will last for approximately 90 minutes and will take place in one of the conference rooms at ***Organization Name and Location***. Each participant will receive a $10 gift card as a small token of appreciation for your contribution to the research. Refreshments and a snack will also be provided. Your participation is voluntary and you may drop out of the discussion at any time. All findings from this research will be reported in aggregate; your identifying information will be not disclosed.

For more details or to participate in the study, please respond to this email or contact [**name of research personnel and data collection site contact**].

Thank you,

Site Coordinator

APPENDIX B

Hospital Permissions

January 27, 2017

To the University of Nebraska Lincoln Human Subjects Research Review Committee:

Our organization is pleased to partner with Dr. Jeri Brittin of University of Nebraska-Lincoln and HDR Inc. to study and evaluate our facility's performance, employee satisfaction and patient outcomes. We believe that this collaboration will inform our processes and improve the quality and delivery of our healthcare services for our staff and patients.

Dr. Jeri Brittin and her team have fully informed me of the research project entitled, "Evaluation of New Nebraska Hospital Facilities." I understand Great Plains Health's involvement includes allowing employees to participate in surveys and focus groups, providing de-identified patient information, and allowing researchers needed access to our facility. I further understand that this research will be carried out following sound ethical principles and that participant involvement in this research study is strictly voluntary and provides confidentiality of research data.

As a representative of Great Plains Health, I agree that this research project may be conducted at our facility.

Sincerely,

Mel McNea
Chief Executive Officer

601 West Leota St. | PO Box 1167 | North Platte, NE 69103 | P 308.696.8000

Fremont Health

January 19, 2017

To the University of Nebraska Lincoln Human Subjects Research Review Committee

RE: Letter of Agreement for IRB

Fremont Health has undergone a major facility planning, design and construction project with HDR. Planning started in the 2012 - 2013 timeframe, and the construction was completed in 2015. As part of the planning and design process, Fremont Health and HDR set several goals and/or metrics that we intended to accomplish via an improved facility design and associated work processes. These goals and metrics align well with the Post-Occupancy Evaluation and research study that we have now engaged in with HDR.

Fremont Health is excited to partner with Dr. Jeri Brittin of the University of Nebraska-Lincoln and HDR, Inc. to study and evaluate our new facility's performance, associated employee satisfaction, and patient outcomes. We believe that this collaboration will help inform us about our successes and opportunities to date and will improve the quality and delivery of healthcare services for our patients and our staff.

Dr. Jeri Brittin and her team have shared plans for the research project entitled, "Evaluation of New Nebraska Hospital Facilities." I understand that Fremont Health's involvement includes allowing employees to participate in surveys and focus groups, providing de-identified patient information ("Limited data set") for analysis, and allowing researchers needed access to our facility. I further understand that this research will be carried out following sound ethical principles and that participant involvement in this research study is strictly voluntary and provides confidentiality of research data.

Therefore, as a member of Fremont Health and its executive administration, I agree that this research project may be conducted at our facility.

Sincerely,

Peg Kennedy

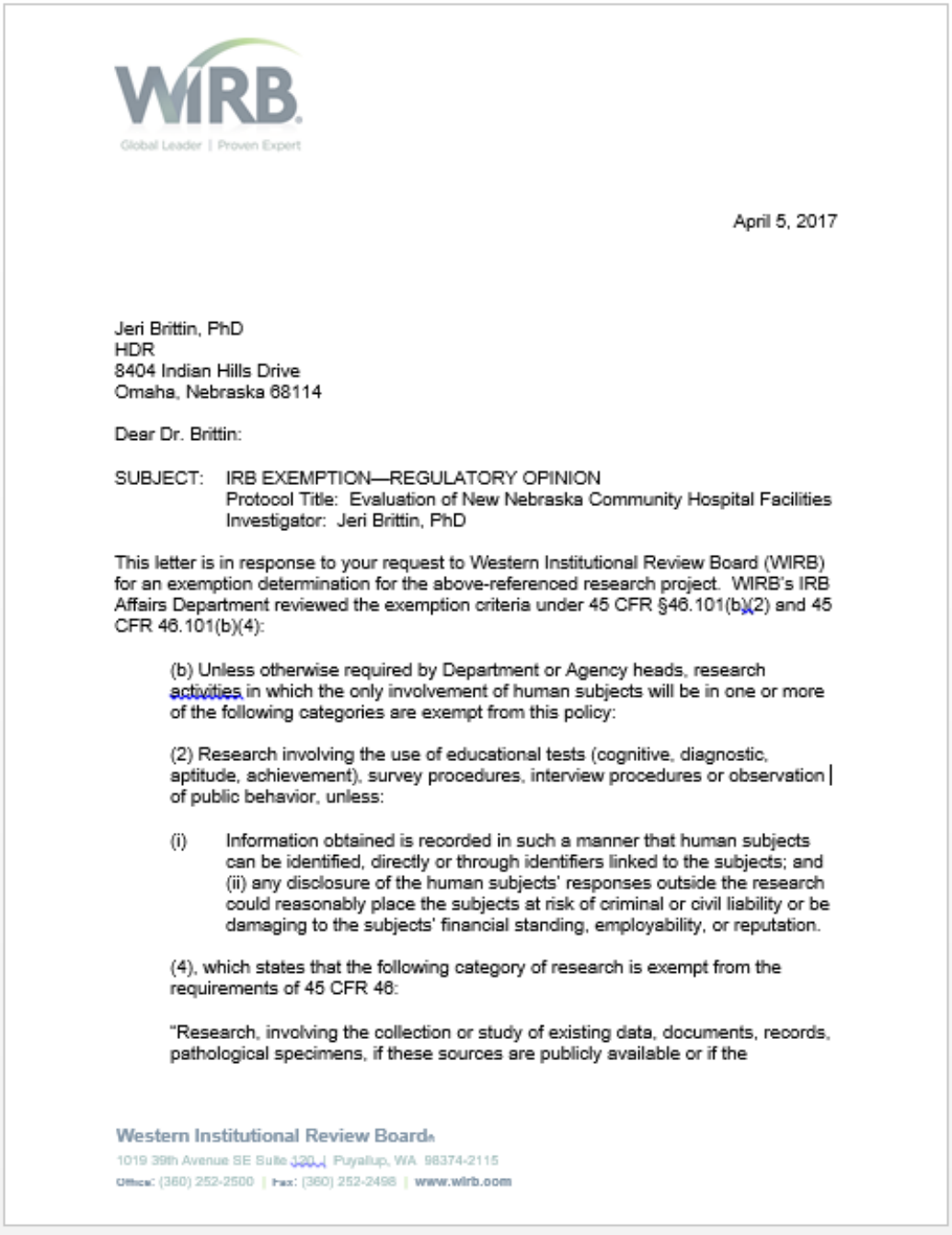
Peg Kennedy
Vice President & Chief Nurse Executive
Fremont Health

HDR IRB Letter of Agreement

450 East 23rd Street | Fremont, NE 68025 | 402-721-1610

APPENDIX C

IRB Approval



WIRB
Global Leader | Proven Expert

April 5, 2017

Jeri Brittin, PhD
HDR
8404 Indian Hills Drive
Omaha, Nebraska 68114

Dear Dr. Brittin:

SUBJECT: IRB EXEMPTION—REGULATORY OPINION
Protocol Title: Evaluation of New Nebraska Community Hospital Facilities
Investigator: Jeri Brittin, PhD

This letter is in response to your request to Western Institutional Review Board (WIRB) for an exemption determination for the above-referenced research project. WIRB's IRB Affairs Department reviewed the exemption criteria under 45 CFR §46.101(b)(2) and 45 CFR 46.101(b)(4):

(b) Unless otherwise required by Department or Agency heads, research activities in which the only involvement of human subjects will be in one or more of the following categories are exempt from this policy:

(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless:

(i) Information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

(4), which states that the following category of research is exempt from the requirements of 45 CFR 46:

"Research, involving the collection or study of existing data, documents, records, pathological specimens, if these sources are publicly available or if the

Western Institutional Review Board®
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Office: (360) 252-2500 | Fax: (360) 252-2498 | www.wirb.com

information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects."

We believe that the survey and focus group portions of this research fit the above exemption criteria under 46.101(b)(2): The survey data will be collected in a way so that the subjects cannot be identified, directly or through identifiers linked to the participants, and the focus group data will be collected in a way so that the subjects can be identified, directly or through identifiers linked to the participants. However, any disclosure of the human subjects' responses outside the research will not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation. We believe that the portion of this research involving the collection of data from patients admitted to inpatient units fits the above exemption criteria under 46.101(b)(4): The limited data set is in existence as of March 23, 2017, and the information will be recorded in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

This exemption determination can apply to multiple sites, but it does not apply to any institution that has an institutional policy of requiring an entity other than WIRB (such as an internal IRB) to make exemption determinations. WIRB cannot provide an exemption that overrides the jurisdiction of a local IRB or other institutional mechanism for determining exemptions. You are responsible for ensuring that each site to which this exemption applies can and will accept WIRB's exemption decision.

Please note that any future changes to the project may affect its exempt status, and you may want to contact WIRB about the effect these changes may have on the exemption status before implementing them. WIRB does not impose an expiration date on its IRB exemption determinations.

If you have questions, please contact WIRB Regulatory Affairs at 380-252-2500, or e-mail RegulatoryAffairs@wirb.com.

Al:tb
B2 & B4-Exemption-Brittin (04-05-2017)
cc: Francesqca Jimenez, HDR (via e-mail to francesqca.jimenez@hdrinc.com)
WIRB Accounting
WIRB Work Order 1-1003733-1

APPENDIX D

Study Information Sheet

FOCUS GROUP INFORMED CONSENT FORM
Study Title: Evaluation of New Nebraska Hospital Facilities

PURPOSE OF THE FOCUS GROUP:
You have been asked to participate in a focus group conducted by HDR Architecture, in cooperation with ***Organization Name***. The purpose of this research is to understand how the built environment affects your experience as an employee of ***Organization Name***. We are particularly interested in hearing about your experiences working on the new decentralized nursing units and how these changes affect your work. The information learned in the focus groups will be used to inform architects, designers, and hospital administrators about how to better design healthcare facilities and delivery.

PROCEDURES:
Individuals 19 years of age and older are invited to participate in the focus group because you work on one of ***Organization Name's*** decentralized patient units. Focus group participation will require approximately 90 minutes of your time. During the session you will be asked questions that focus on the design of facility in which you work and how the design affects your ability to perform your job duties, the organizational changes that occurred with the design, as well as your personal comfort in the new environment. There are no right or wrong answers to the focus group questions. We want to hear many different viewpoints and would like to hear from everyone. We hope you can be honest even when your responses may not be in agreement with the rest of the group. In respect for each other, we ask that only one individual speak at a time in the group and that responses made by all participants be kept confidential.

RISKS AND DISCOMFORT:
There are no presently known risks or discomforts associated with this research.

BENEFITS:
The information gained from this study will give us a better understanding of how or if nursing unit design affects nursing staff hospital operations, and healthcare delivery. This information could aid planners, designers, and stakeholders in creating better solutions for healthcare environments in the future. Focus group discussions will inform decision-makers about improvements that could be made

to services and methods of delivery. There are no direct benefits to you as a research participant.

CONFIDENTIALITY:
Although the focus group will be audio recorded, your responses will be kept confidential. The data from the focus groups will be stored on HDR's secured server and will only be seen by research personnel. The data will be kept for one year after the study is complete. The finding of this study may be published in scientific journals or presented at conferences, but the data will only be reported in the aggregate. No names will be mentioned in any report of the findings.

COMPENSTION:
As a small token of thanks and appreciation for your participation in our research you will receive a $10 gift card.

OPPORTUNITY TO ASK QUESTIONS:
You may ask questions concerning this research and have those questions answered before agreeing to participate in, or during the study. Or you may contact, at any time, the investigator(s) at the phone numbers below to voice concerns about the research or if you have any questions about your rights as a research participant.

FREEDOM TO WITHDRAW:
Participation in this study is voluntary. You can refuse to participate or withdraw at any time without harming your relationship with the researchers or ***Organization Name***, or in any other way receive a penalty or loss of benefits to which you are otherwise entitled.

CONSENT, RIGHT TO RECEIVE A COPY:
You are voluntarily making a decision whether or not to participate in this focus group. Your signature certifies that you have decided to participate having read and understood the information presented and agree to be audio recorded. An additional copy of this consent form is available for your records.

SIGNATURE OF PARTICIPANT:

_____	_____
Signature of Research Participant	Date
_____	_____
Signature of Researcher	Date

Investigator Contact Details

NAME & PHONE NUMBER OF INVESTIGATORS

Susan McDevitt MS, Primary Investigator	(704) 248-3605
Jeri Brittin, Ph.D., MS, Researcher	(402) 399-1130
Francesqca Jimenez, MS, Researcher	(402) 399-4891
Renae Rich, MS, Researcher	(402) 399-4811

APPENDIX E

Biographical Data Survey

For each question, please circle the ONE response that best fits you.

1) Have you ever worked in a unit that had a centralized nurse station as the primary place for nurse work to occur?

YES NO

2) How many years have you been an RN?

0-4 5-9 10-14 15-19 20-24 25+

3) How many years have you worked at this hospital?

0-4 5-9 10-14 15-19 20-24 25+

4) What is your age range?

20-25 26-35 36-45 46-55 56-65 66+

5) Gender:

FEMALE MALE

6) Ethnicity:

White (NonHispanic) Hispanic African American Asian Other

7) Highest completed degree:

ADN BSN MSN PhD DNP

APPENDIX F

Perception Questionnaires

Rate your perception of ***centralized nursing units*** on each of the following dimensions. Indicate your rating by circling the appropriate word(s).

Supports Quality Patient Care				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Supports My Effective Social Communication				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Supports My Patient Documentation				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Decreases My Work Stress Level				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Increases My Health and Wellbeing				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Increases My Work Performance				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Rate your perception of ***decentralized* nursing units** on each of the following dimensions. Indicate your rating by circling the appropriate word(s).

Supports Quality Patient Care				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Supports My Effective Social Communication				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Supports My Patient Documentation				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Decreases My Work Stress Level				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Increases My Health and Wellbeing				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Increases My Work Performance				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

My Preferred Work Environment	
Centralized Nursing Unit	Decentralized Nursing Unit

APPENDIX G

Study Group Script

WELCOME Thank you for agreeing to be part of the focus group. I appreciate your willingness to participate.

INTRODUCTIONS Moderator and Assistant Moderator(s)

My name is Susan McDevitt, I will lead the focus group discussion today.

PURPOSE OF FOCUS GROUPS

The purpose of the group is to understand your experience of how the built environment affects you and your daily experiences. This will aid architects, planners, designers, and owners in creating better solutions for the environment in the future. I would like the focus of the discussion today to be on your experience of being in your current work environment and how the building affects your work processes and overall satisfaction.

GROUND RULES

1. I WANT YOU TO DO THE TALKING. I would like everyone to participate. I may call on you if I haven't heard from you in a while.

2. THERE ARE NO RIGHT OR WRONG ANSWERS Every person's experiences and opinions are important. Speak up whether you agree or disagree. I want to hear a wide range of opinions.

3. WHAT IS SAID IN THIS ROOM STAYS HERE I want you to feel comfortable sharing when sensitive issues come up. Please do not converse with anyone about this discussion until the study completion date of _____.

4. I WILL BE AUDIO RECORDING THE GROUP I want to capture everything you have to say. I won't identify anyone by name in our report. You will remain anonymous.

PLEASE INTRODUCE YOURSELF Have participants introduce themselves to the group.

APPENDIX H

Focus Group Questions

Fremont/Great Plains Health – Nursing Staff

Welcome:
Introductions and initial questions (everyone asked to answer):

1. Please introduce yourself and specify your role and the unit you work in (if applicable) at Fremont Health/Great Plains Health.
2. What is your favorite aspect about the design of your unit in the new expansion/new bed tower?
3. What is one aspect about the design that causes the most problems for you and/or your team on your unit?

Specific questions about the new unit design:

1. What are some characteristics of quality care?
   - What features of the unit design support your ability to provide quality care for patients?
   - Are you able to provide better quality of care than in the previous facility?
   - Do you believe this has impacted patient outcomes?
2. How do you feel the design of your patient unit facilitates professional and social communication?
   - Do you believe you know what is going on throughout the unit during your shift?
   - How and from whom do you usually get information?
   - Where and when do conversations with colleagues typically take place?
   - Can you describe how you get and lend help?
3. How do you feel the design of your patient unit supports nurses' chart documentation?
   - Where do you spend the most time charting? (Explain survey results)
   - Has your method / timeliness of charting changed due to the decentralized unit design?
4. How do you feel the design of your patient unit affects your overall health?
   - What is your typical level of fatigue due to?
   - Has it changed with the new design?

5. What did your management do to prepare and guide you through these changes? What did you do to prepare and move through the change process?
    - Were you informed as to why the decision was made to introduce the change?
    - Were you involved in discussion of the advantages and disadvantages behind the new model?
    - Were there any process improvement initiatives, new work flow mapping done to prepare for/as a result of the change?
    - In what ways could this process have been improved?
6. As new employees and new nurses come to the organization, is the decentralized model discussed and what if any, strategies are in place to help staff be successful?

Fremont/Great Plains Health – Nurse Management

Welcome:
Introductions and initial questions (everyone asked to answer):

1. Please introduce yourself and specify your role and the unit you work in (if applicable) at Fremont Health/Great Plains Health.
2. What is your favorite aspect about the design of your unit in the new expansion/new bed tower?
3. What is one aspect about the design that causes the most problems for you and/or your team on your unit?

Specific questions about the new unit design:

1. How do you believe the design of the patient units facilitates professional and social communication?
    - Do you believe like your staff knows what is going on throughout the unit?
    - How and from whom does your staff usually get information?
    - Where and when do conversations with colleagues typically take place on the units?
    - Does your staff know when their colleagues need help and offer assistance?
    - Is your staff able to get help when they need it?
2. What did you do to prepare and move through the change process? What you do to prepare and guide your staff through these changes?
    - Were you informed as to why the decision was made to introduce the change? Did you inform your staff?
    - Were you involved in discussion of the pros and cons behind the new model? Did you involve your staff?
    - Were there any process improvement initiatives, new work flow mapping done to prepare for/as a result of the change?
3. Reflecting on the change to the new environment, what are some ways that the process could have been improved?
4. As new employees and new nurses come to the organization, is the decentralized model discussed and what if any, strategies are in place to help staff be successful?

APPENDIX I

Transcriptionist Confidentiality Statement

Transcriptionist Confidentiality Statement

I _____ (name of transcriptionist) agree to hold all information contained on audio recorded tapes/ and in interviews received from_____ (Name of PI), primary investigator for _____, (Name of the project) in confidence with regard to the individual and institutions involved in the research study. I understand that to violate this agreement would constitute a serious and unethical infringement on the informant's right to privacy.

I also certify that I have completed the CITI Limited Research Worker training in Human Research Protections.

_____ _____

Signature of Transcriptionist Date

_____ _____

Signature of Principle Investigator Date

VITA

In June of 1996, Susan McDevitt graduated from The Ohio State University with a Bachelor of Science in Human Ecology. In June of 1998, she graduated from The Ohio State University with a Bachelor of Science in Nursing. After five years in nursing she continued her education and in June 2003, she graduated from Northeastern University with a Masters in Science and successfully passed her board exam and spent the next 12 years as a neonatal nurse practitioner. She entered the Graduate School of Stephen F. Austin State University in the fall 2013, and received her Master of Science in Human Sciences with a concentration in Healthcare Design in the winter of 2017. She began working for HDR as a senior clinical consultant in 2015 and was promoted to professional associate in 2017.

Permanent Address: 8053 Clems Branch Road
Fort Mill, SC. 29707

Style manual designation: *Publication Manual of the American Psychological Association*, 6th Edition.

This thesis was typed by Susan L. McDevitt.